boot

FOR PC FANATICS

PURE PC POWER

FINALLY! 3D Accelerators Declared boot**Worthy**

DirectX under **Fire**

12 Step: **Motherboard** Makeover

OS /2: Dead or **Alive?**

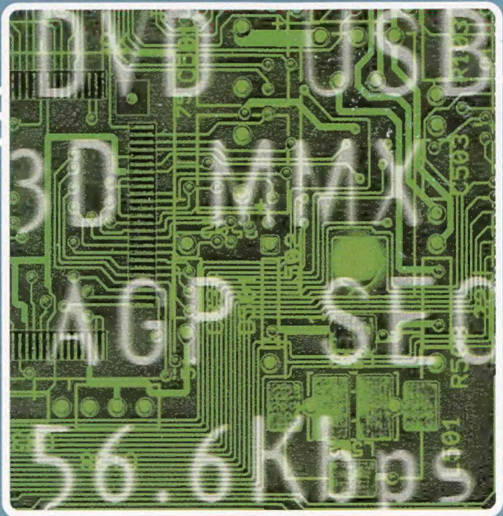
White Paper explains **3D** Jargon from **A**nti-Alias to **Z**-Buffer

EXCLUSIVE! The **First** USB Peripherals **Test** Driven!

meet the IN crowd:

TECH, SPECS, & PIX of THIS ***SPRING'S*** *HOTTEST* ***NEW*** *SYSTEMS*

8 page preview!



65 H/W and S/W Releases P/Reviewed:

Klamath **Unveiled**!

Voxel Space **2**: the **best** terrain generator **ever**?

The **Golf** War

CH's **Force** Feed**back**

plus:

NT Work**stations** from **Compaq** & Inter**graph**

imagine
a new way of publishing

$7.99 U.S. & $8.99 Canada

MAR 07 97

www.bootnet.com

FINALLY, A DIGITAL CAMERA
WITH EVERYTHING YOU NEED
TO UNLEASH THAT MAD,
IMPETUOUS ARTIST WITHIN.

SONY VIDEO LENS
f=4.8mm 1:2.0
SONY
DIGITAL STILL CAMERA DSC-F1

Oh-la-la, make room in your imagination for the pocket-size Sony DSC-F1. Then simply aim, shoot and save up to 108 sharp, clear pictures for instant downloading of your creative genius. The DSC-F1's all-encompassing list of features includes a LCD screen for instant review, wireless* transfer of images, and of course, Sony's leading CCD technology for outstanding image quality. Making it the crème de la crème of digital cameras.

Integrated LCD screen.

For more information on the Sony DSC-F1, just call 1-800-352-7669 or visit www.sony.com/technology. And turn your work into a work of art, tout de suite.

SONY

640 x 480 Resolution, 24-Bit Color

Built-In Wireless Infrared and Serial Interface

1.8" Color LCD Screen

Stores 108 Images at 640 x 480

Built-In Flash

Video Output for TV

Rechargeable Lithium Ion Battery

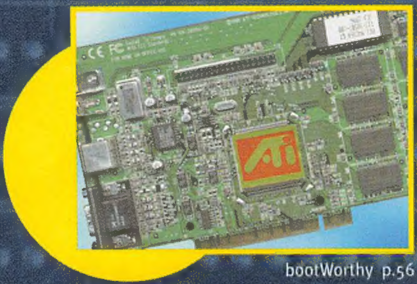
Mac® and PC Connection Kit Included

Sony's Progressive Scan CCD

©1996 Sony Electronics Inc. All rights reserved. Reproduction in whole or part without written permission is prohibited. Sony and the Sony logo are trademarks of Sony. Windows is a trademark of Microsoft Corporation. Mac is a trademark of Apple Computer, Inc. Screen images are simulated. *Supports Microsoft Windows® 95 IrDA Device Driver Version 2.0 (included). IrDA adapter for computer required.

CONTENTS07

boot PURE **PC** POWER


bootWorthy p.56

news

18 nuggets
A compendium of **stuff** you can't believe you ever got by not knowing before.

20 bootWire
News that matters. **DirectX** comes under fire from **id**'s Carmack; Reports of **OS/2**'s death have been greatly exaggerated; and **Microsoft** announces plans to implement **DVD**.

p/reviews

56 bootWorthy: 3D Accelerator Cards
Readers have been demanding it and now *boot* delivers... *these* are the 3D cards we would buy.
- ATI **3D Xpression+** PC2TV
- **PowerVR** PCX1
- Canopus **Total 3D**
- Orchid **Righteous 3D**/Diamond **Monster 3D**

60 Previews
First looks at all the products and technologies that'll change your world.

66 Reviews
We get so much ultra-cool **gear** in the **bootLab** each and every month, it blows our minds...
- **NT**-powered **Work**stations
- Jet **Fighter** III
- **Nokia**'s 20-inch multi-**multimedia** monitor and more **tech** to keep you tripping...

Compaq 1030 Notebook p.78

voices

5 Editor's Words
bootChief **Brad Dosland** employs more Jedi mind tricks on an unwary world.

27 Game Theory
Columnist **T. Liam McDonald** searches for signs of intelligent life in *BC3K*.

29 On the Line
Columnist **Shel Kimen** is surprised that the much-touted Shockwave format failed.

31 Fast Forward
Columnist **Tom Halfhill** wonders what Intel's new mother/daughter relationship will do to the PC's open architecture.

111 Glitch
Columnist **Jon Phillips** cuts through all the techno-jabber with *boot For Dummies.*

Redneck Rampage p.65

departments

8 Comm Port
Readers tell us what's what via e-mail, fax, and postcards from Perth.

14 bootDisc and bootNet
Slap it in, boot it up, and check it out. Every month the *bootDisc* contains **demos** of the software featured in the pages of *boot* magazine, including:
- *Privateer 2*
- *FreeHand 7*
- *Jet Fighter III*
- *Links LS*
- and many, many more.

Plus: A demo of Macromedia's *Director 5.0*, so you can follow along with this month's *Online Afterburner* feature.

24 Pure Lust
Tech **toys** for digital girls and boys.

50 12-Step Program and Clinic
This month: Your **motherboard**'s done everything for you. Show you care and give her a makeover. We show you how! Plus, take all your itches to **The Clinic**.

107 bootRadar
New products go ping!

features

GATEWAY
SU
PACKARD BELL NEC
SONY AST MICRON
FUJITSU
TEWA

The IN Crowd p.42

42 The IN Crowd

This spring, the IN Crowd of new PCs from the top companies will be primping their wares on the *boot* runway. Fresh from the sketchpads of the most fabulous designers in Paris, Milan, and San Jose, this year's models are dressed to the nines, so let's go to the show floor...

Firing the Online Afterburner p.36

36 Firing the Online Afterburner

Web pages don't need to be a static mass of icons and text. Dynamic presentations, complete with sound and motion, can be imported from *Director* straight to your site as a Shockwave applet. The only limitations are bandwidth and your imagination.

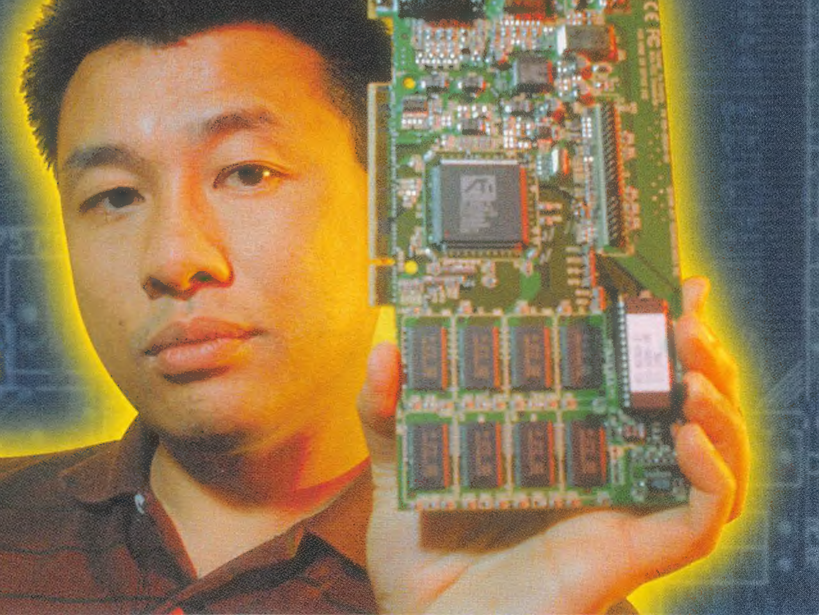
Lip 32

"We had a vision, about four or five years ago, that these so-called 'business' graphics accelerators could be used for games. Everyone kind of laughed at the idea..."

Who's laughing now?

ATI's
Henry Quan

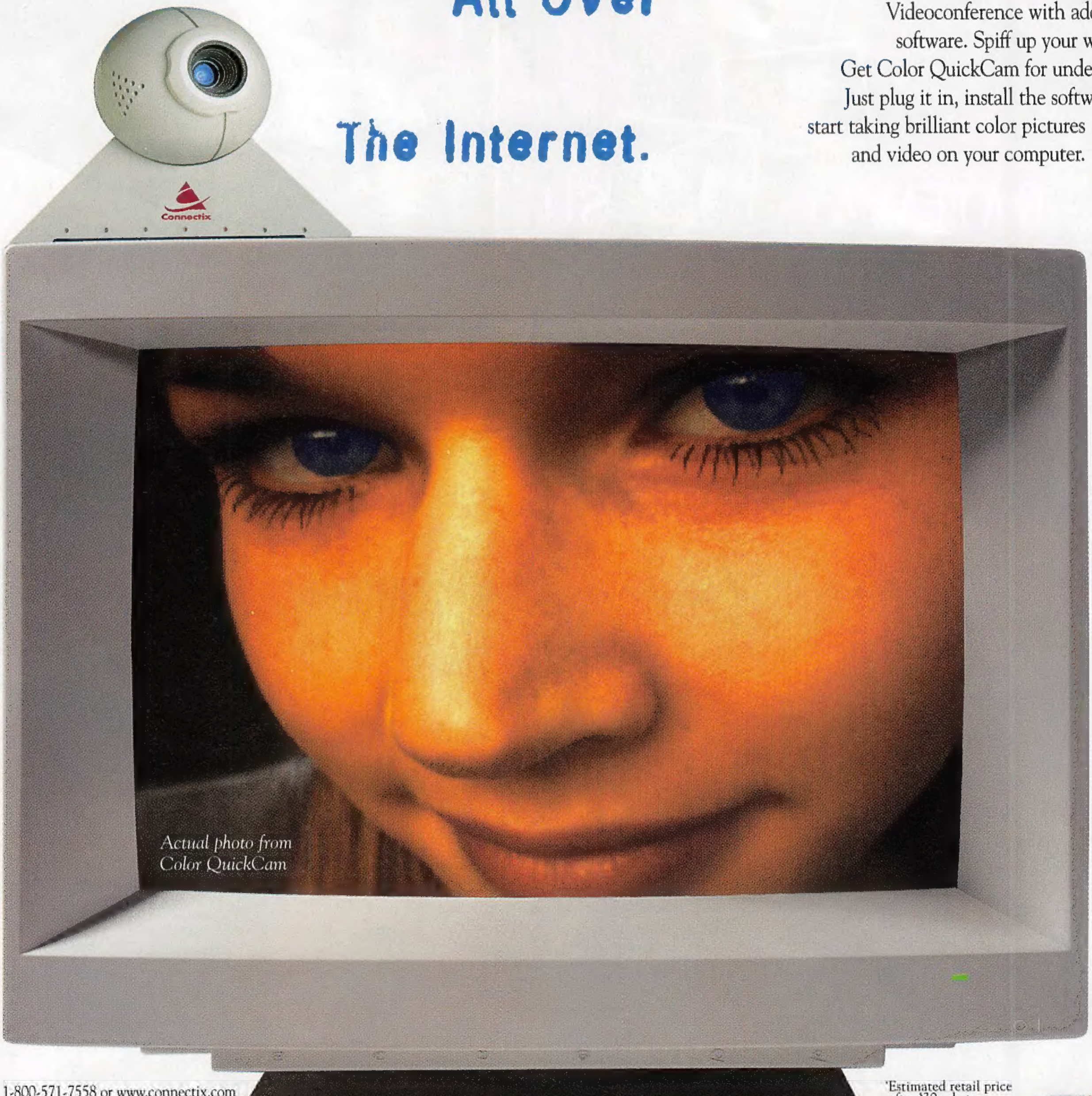
That's who!



Now You Can Bat Those Baby Blues All Over The Internet.

Introducing Connectix Color QuickCam™, the camera and software that lets you use your computer in fun ways at home, business and on the net. Send personalized cards. Add images to business reports. Videoconference with additional software. Spiff up your web site. Get Color QuickCam for under $200*. Just plug it in, install the software and start taking brilliant color pictures and video on your computer.

Connectix



Actual photo from Color QuickCam

1-800-571-7558 or www.connectix.com

*Estimated retail price after $30 rebate

Color QuickCam

Now You Can With Color QuickCam

For Windows and Mac platforms. Available wherever computer products are sold.

© 1996 Connectix Corporation. 2655 Campus Drive, San Mateo, CA 94403 USA • 415-571-5100 • FAX: 415-571-5195 • EMAIL: info@connectix.com. QuickCam is a trademark of Connectix Corporation. All other trademarks are the property of their respective holders.

Product Information Number 111

boot

march 1997

EDITORIAL
Editor in Chief: Brad Dosland
News Editor: Bryan Del Rizzo
Technical Editor: Chris Dunphy
Reviews Editor: Andrew Sanchez
Production Editor: Ingrid Bush
Contributing Editors: Tom Halfhill, Shel Kimen, T. Liam McDonald, David Pescovitz, Jon Phillips
Contributing Writers: David Boles, Lee Buchanan, Brad Craig, Quintin Doroquez, Lauren Guzak, Marty Jerome, Neil Redding, David Rubin, William Trotter, Tim Tully
Disc Editor: Sean Downey
Associate Disc Editor: Sean Cleveland
Web Goth: Daevid Vincent

ART
Art Director: Laura Morris
Associate Art Director: Inka Petersen
Contributing Artist: Gerry Serrano
Contributing Photographers: Aaron Lauer, Mark Madeo

PRODUCTION
Production Director: Richard Lesovoy
Production Coordinator: Ken Brandow

ADVERTISING
National Advertising Manager: Angela Mueters
Regional Advertising Manager: Chris Coelho
Regional Advertising Manager: Juanita Nessinger
Marketplace Account Manager: Julianne Counter
Advertising Coordinator: Jennifer Barbeau
Marketing Manager: Angela Bennett

CONTACT
boot
150 North Hill Drive, Brisbane, CA 94005
URL: www.bootnet.com
Subscriptions phone: 415.468.4869
Subscriptions e-mail: subscribe@bootnet.com
Advertising: 415.468.4684, ext. 110
Editorial: 415.468.4684; editor@bootnet.com
FAX: 415.468.4686

CIRCULATION
Circulation Manager: Tina Rodich
Fulfillment Manager: Judy Apostol
Newsstand Director: Bruce Eldridge
Newsstand Manager: Thea Selby
Newsstand Analyst: Terry Lawson
Circulation Consultant: Gail Egbert

IMAGINE PUBLISHING, INC.
Publisher: Matt Firme
Director of CD-ROM Development: Thomas Hale
New Media Business Development Manager: Mary Hoppin
Creative Director: Laura Morris
Vice President of Circulation: Holly Klingel
Vice President/CFO: Tom Valentino
President: Chris Anderson
INTERNATIONAL LICENSING REPRESENTATIVE
Robert J. Abramson and Associates, Inc.
720 Post Road, Scarsdale, NY 10583

VOLUME 01, ISSUE 06
boot (ISSN #1088-5439) is published monthly by Imagine Publishing, Inc., 150 North Hill Drive, Suite 40, Brisbane, CA 94005, USA. Periodical class postage paid in Brisbane, CA and at additional mailing offices. Newsstand distribution is handled by Curtis Circulation Company. Basic subscription rates: one year (12 issues) U.S. **$39.90**, Canada **$53.90**. Canadian price includes postage and GST (GST #128220688). **POSTMASTER:** Send changes of address to *boot*, P.O.Box 51479, Boulder, CO 80328-1479.

Bulk Rate, U.S. Postage Paid,
Waseca, MN, Permit No. 350

Standard Mail enclosed in the following editions: A3, B, B1, B2. CPC Int'l Pub Mail # 0781029. Outside the U.S. and Canada, price is $53.95, U.S. pre-paid funds only. For customer service, write *boot*, P.O. Box 51479, Boulder, CO 80328-1479, *boot*, 150 North Hill Drive, Brisbane, CA 94005. Imagine Publishing also publishes *PC Gamer, Next Generation, Mac Addict, Game Players* and *The Net*.

Entire contents copyright 1996, Imagine Publishing, Inc. All rights reserved. Reproduction in whole or in part is prohibited. Imagine Publishing, Inc. is not affiliated with the companies or products covered in *boot*.

PRODUCED IN THE UNITED STATES OF AMERICA.

EDITOR'S WORDS

I'm a Marked Man

The old saying goes: "You can tell a lot about a person by looking through their bookshelf." Well, you can also tell a lot about the type of people who would be so intrusive as to root through your bookshelf, but the principle holds true. Only today, you're more likely to get to know someone by perusing their browser's bookmarks than any ink on paper collection sitting around the house.

Well, you don't need to worry about invading my space, because I'm offering up a guided tour of some of my most frequently visited bookmarks. These are some of the sites the rabid PC fanatics at *boot* like to pop by when two free minutes spring up.

Of course, we begin our tour on the page my browser lands on at launch: **www.altavista.digital.com/cgibin/query?pg=&text=yes.** AltaVista is still the search engine of choice and even with the T1 line that *boot* feeds off like an umbilical cord, the text version delivers maximum blaze when it comes time to search and destroy.

When I can't come up with anything to search for, I lurk at: **voyeur.mckinley.com/voyeur.cgi** and see what other people are searching for. This amazingly hypnotic service will expand your consciousness. Who'd have thought that at this moment, someone's trying to find Molly Ringwald on the web. And why are so many people looking for pictures of nude celebrities?

Technically, I probably shouldn't admit that I read another computer publication on the web, but... CMP's Electronic Engineering Times (**techweb.cmp.com/eet/823/default.html**) is the only place to find any sort of lasting fix when I get a major tech jonesing.

For every yin, there is a yang. And to counter the boyz of the bootLab, there are the RiotGrrls. Nikki, Venus, and the gang reside at **www.riotgrrl.com/**. The femme fatales at RiotGrrl will dispel any prejudices you may posses regarding women and technology. Stop by and say Brad sent you.

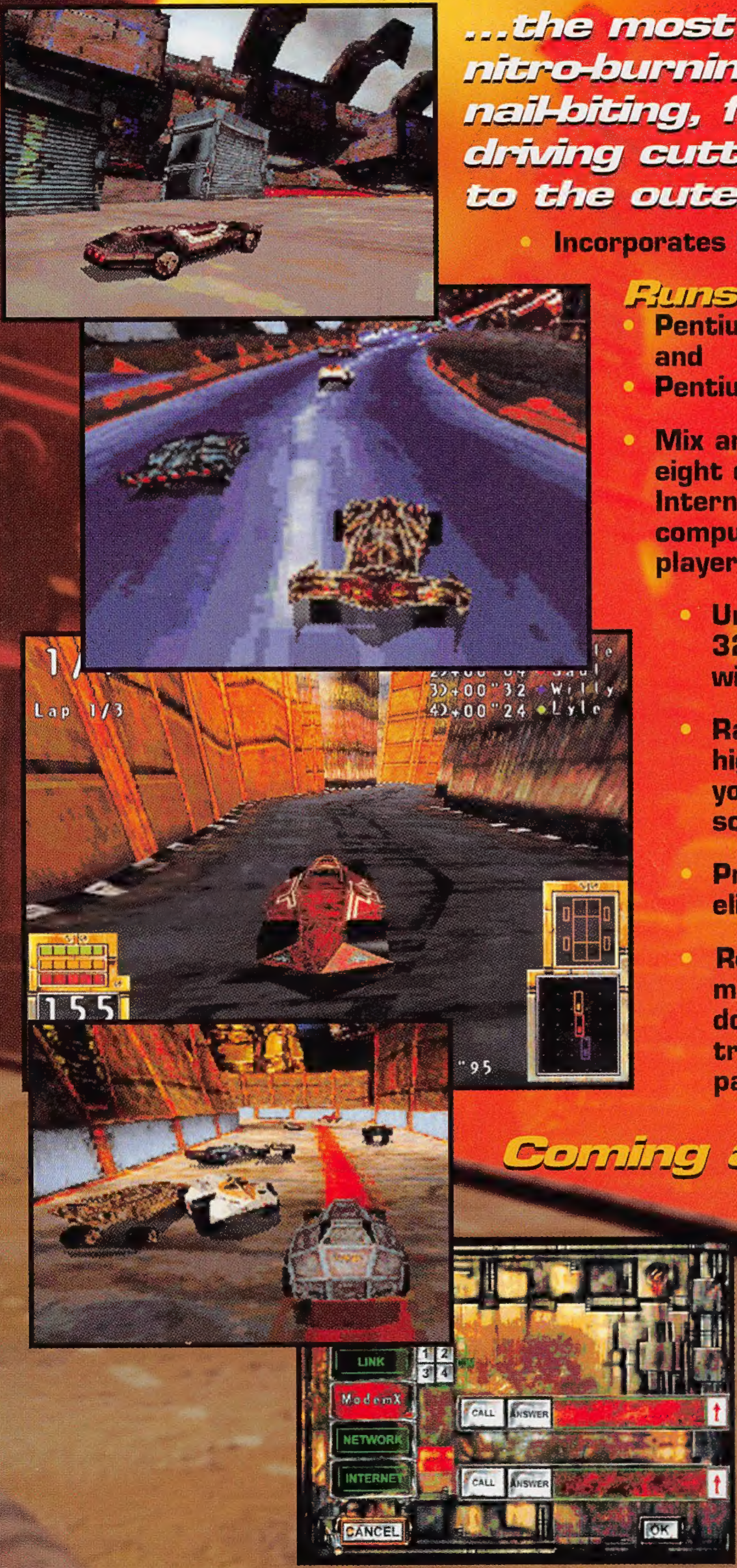
One thing *boot* prides itself on is the brutally honest approach to the PC industry that distinguishes us from the rest of the PC press. We call 'em how we see 'em, and have a blast doing it. Whenever I get to feeling a little too "establishment," I check into **www.disinfo.com/** and reset my anarchistic edge.

When I'm not plugged into a PC like some sort of carbon-based peripheral, I'm packing U.S. Robotics' clever little PDA, the Pilot. But once you've mastered *Giraffe* and imported your entire phone directory, what's there to do? Simple. Go to **www.inforamp.net/~adam/pilot/** and start downloading more apps, utilities, and demos than your memory can bear. I'm in the middle of Jonathan Swift's 1729 classic, *A Modest Proposal*, in *Doc* format and composing the first symphony for a quartet of Pilots in *PocketSynth*.

When I'm overloaded with tech (believe it or not, it *is* possible), I sneak off to **espnet.sportszone.com/** to check out what every web site oughta be like. Forget the whistles and bells. I don't need goofy little animations to bedazzle my eyes, or a repetitive background soundtrack to chew my download time and keep me from the content I came for. ESPN's site delivers.

Hopefully, that gives you some idea of what makes me tick (besides the bomb I carry in my notebook bag.) I'm always interested in expanding my itinerary, so share your favorite bookmarks with me at **bdosland@bootnet.com**.

The Only High-Speed, Internet-Direct Racing Game on this Planet...or Any Other.



...the most explosive, hypersonic, nitro-burning, neck-jerking, nail-biting, futuristic game ever is driving cutting edge technology to the outer limits:

- Incorporates State-of-the-art MMX™ technology

Runs on:

- Pentium® processors with MMX™ technology, and
- Pentium® processors 120 MHz and higher
- Mix and Match multi-player options (Up to eight direct player connection over the Internet, local network or modem; two computer direct link connection, and two player split screen option.)
- Unprecedented speed...playable at up to 32 frames per second! (Up to 80 fps with a 3-D accelerator card!)
- Race others over the Internet, against highly advanced artificial intelligence, your own recorded "ghost" or someone else's.
- Pre-calculated position engineering eliminates latency over the Internet!
- Revolutionary website includes player matching, chat rooms, ranking lists, downloadable and uploadable ghosts, tracks, and cars, customizable web pages for every player...and more.

Coming at you April 1st...

Get ready for it or get out of the way...

Check Out the White-Knuckled, Turbo-Charged SHAREWARE at:

www.ubisoft.com

Ubi Soft
pod™

©1997 Ubi Soft Entertainment, Inc. All rights reserved. Pentium® is a registered trademark and MMX™ and the MMX™ logo are trademarks of Intel Corporation. Dolby and the Double-D symbol are trademarks of Dolby Laboratories Licensing Corporation. All other trademarks are the property of their respective holders.

KIDS TO ADULTS
K-A
CONTENT RATED BY ESRB

Designed for Windows® 95

3Dfx

ATI 3D

S3d Onboard
S3 Incorporated

PowerVR

DOLBY SURROUND

Intel MMX™
DESIGNED FOR

Product Information Number 332

comm port

LETTERS TO THE EDITORS

Learning experience

In this unholy and wretched world we call "society," the only real sense of peace is when I sit at my blessed computer and start slashing away. I happened across your magazine in my rush to absorb all information regarding computers and the Internet. I'm a fast learner and know enough to hack my own HTML, but when it comes to SIMMs and video cards and input/output ratios, I'm lost in a freakish wavelength! I have my pride, but must swallow it and say, "Please help me out of this barren wasteland of ignorance."

Jethro Bodean

N64 vs. C64

I loved the comparison of the Nintendo 64 and the Commodore 64 in *boot* 05—easily the funniest quarter of a page in *any* magazine. The scary part is: If I could only own one "electronic entertainment unit" I think I really would choose the C64 over the N64.

Alan Robinson

"Clearly, the C64 is the far superior machine." I scratched my head in disbelief! If this is what you think of the N64, how could you be reviewing computers? Sure, the C64 has 10,000 titles, but the N64 is not even six months old! And the quote: "Sure, the N64 has a slight edge in graphics and sound, but gameplay makes the system," really blew me away! Slight edge? Hopefully soon you'll crawl out of your hole and see that it's the most advanced gameplay system on the market (except for the PC). If the C64 is the "far superior machine," then I wouldn't trust you reviewing real computers.

Joe McIver

DVD beaten to death

After reading Brad Craig's DVD article in *boot* 05, I decided to jump on the DVD bandwagon. The subject of Hollywood and DVD have been beaten to death. Craig, however, did an excellent job presenting the facts; not a one-sided PC lover jumping down the throats of corporations concerned about profit margins.

David Barker

> "In this unholy and wretched world we call 'society', the only real sense of peace is when I sit at my blessed computer and start slashing away."

Glitched

It's great to read a magazine that treats your computer like it's a hot rod, but ya gotta do cartwheels for a guy who treats your brain like it's his private playground! Each month, Jon Phillips explores that sandbox; reminding readers of the humor behind the complexity of bleeding-edge technology.

Paul Griffith

Intelligent filters

Tom Halfhill has some interesting ideas (Fast Forward, *boot* 05), but I don't think laws will work—the j-mail will come from countries that do not have such laws. The only way to squash j-mail will be with intelligent filters that can truly separate the junk from the real mail. Furthermore, who decides what is junk? I subscribe to a "new mailing list" list, and each of those messages is an ad—one that I *want* to get.

RC

bootOS

How about *boot*, together with its readers, develop operating systems, with a few killer apps in mind, to take advantage of the hardware out there and yet to come. It wouldn't be too serious, just start with a 64-bit OS and make a game or two for it. If the hardware comes along, scrap the old OS and do a 128-bit system. Then the next issue (if the hardware is out there)... a quantum mechanical holographic terabit OS and a few games to exploit it. Is *boot* interested?

Jason Dillon

***Editor in Chief Brad Dosland replies:** How 'bout it gang? My uncle has an old barn and we could get costumes and sell tickets and...*

Are two better than one?

I have a question regarding video boards, specifically, using two boards in one system. I have been reading several magazines about ultimate gaming rigs and stumbled upon one that suggested using two boards, one for 2D and some 3D, and the other for 3D. I've also seen ads for the NEC PowerPlayer, that uses two boards in the system. My question is: Would you recommend using two video boards in a system?

I mostly use my PC for games, Internet, and some other home-type uses, but my primary interest is games. I've looked around and what appeal to me the most are the Matrox Millennium, ATI 3D Rage, and Diamond Monster. Will any of these boards run together and are there other boards more suited for this purpose? Keep up the great work. You have by far the best damn mag on the market today!

ToxicShock

***Tech Editor Chris Dunphy replies:** There are two kinds of 3D accelerators available: 2D/3D cards that replace your current graphics card; and 3D-only cards that work in conjunction with your existing card. Windows currently does not support multiple monitors, so you're effectively limited to one 2D graphics card in any system. But we recently experimented with putting an Intergraph Reactor (a 2D/3D Vérité-based card), a Diamond Monster 3D (a 3D-only 3Dfx-based card), and a VideoLogic Apocalypse 3D (a 3D-only PowerVR-based card) into one system, and so far they have worked fine together, each one accelerating the games written specifically for it.*

Outrageous comment

I feel compelled to address Mr. Patrick J. Keating's letter in *boot* 05's Comm Port. Was this guy ever a vet? Or was he a draft dodger? I served six years active duty in the armed forces. I went to foreign lands, I shot at people, I was shot at.

You sir, Mr. Patrick J. Keating, are a coward. You called it "a small war," go to Washington and look at that wall and tell someone standing there with his hand on the wall crying "it was a *small* war," then look at all the names on that wall. This magazine prints *what* it wants, *when* it wants because countless times in the past we did volunteer and did not run away. Keep up the good work *boot*, and thanks for letting no one lead you wrong.

John Davenport
U.S. Navy

Going postal

So far, I've received five issues of your magazine, of which only two have come with a disc. The latest issue was missing the disc again! Do you ship a disc with every issue? If so, then either the mailman is a thief or the postal service in general, sucks.

Craig Reynolds

***Editor in Chief Brad Dosland replies:** Every issue of* boot *ships with a copy of the* bootDisc. *Unfortunately, due to the sheer volume of discs produced, some get a bad pressing at manufacturing, many are stolen on the newsstand, and some may even be lost in the mailing process. Starting in the next few months, we'll be implementing procedures to address all these problems, including a cardboard mount for the disc that should reduce theft and loss. If you ever have a problem with a* bootDisc, *call our customer service department at 415.656.2486. Thanks for your patience.*

More RAM talk

I just finished reading the White Paper about RAM in *boot* 06. *This* is the kind of information that I've been looking for in a magazine. It's this kind of explanation that makes purchasing a new PC easier. I now have a broader understanding of what each of the RAM technologies do and mean. Just a couple more questions: 1) Is parity irrelevant today? It used to be important to get RAM with parity checking. I'm wondering of this is still an issue or, if somewhere in the RAM evolution, parity became a moot point. 2) What are the consequences of mixing and matching different speeds and/or kinds of RAM on a motherboard? What are the

▶ 11

AMBER
Journeys Beyond™

Death Is Not The End

An adventure game of supernatural beauty & haunting elegance for Win '95™

Journey into the unknown. Unravel mysteries hidden within compelling stories of heart-rending tragedy, mind-numbing obsession, and child-like innocence.

HUE FOREST
ENTERTAINMENT

GRAPHIC
SIMULATIONS
CORPORATION

Product Information Number 154

FORMULA 1
All Adrenaline, No Exhaust
FIA FORMULA 1 WORLD
FORMULA 1
PSYGNOSIS
EDS
19

Experience the thrill of high-speed auto racing on your PC with **Formula 1 by Psygnosis™**— a graphics experience so real — each white-knuckle, hair-pin curve will drive you out of your seat.

Better buckle up.

Officially licensed by the Formula 1 Association, every car, track, and detail is enhanced by Voodoo Graphics™ — the most powerful 3D graphics accelerator available — making Formula 1 the most hair-raising thrill-ride you can get outside of a racetrack.

3D Acceleration Required*

Technical Requirements:
System: Pentium 90+, Windows® 95, 2Xs CD ROM drive
Memory: 16Mb RAM
3D Accelerator: Monster 3D, Righteous 3D, PowerPlayer (2010), Pavilion (7295V)
Sound card: Sound Blaster or 100% compatible
Graphics: SVGA video card

PSYGNOSIS

www.psygnosis.com
800.438.7794
Product Information Number 372

* Voodoo Graphics-based product is required.

Voodoo Graphics™ and the 3Dfx Powerfield™ are trademarks of 3Dfx Interactive, Inc. [www.3dfx.com]. Psygnosis™ and the Psygnosis logo are trademarks of Psygnosis Ltd. Formula 1 is licensed by FOCA to Fugi Television. Monster 3D is a trademark of Diamond Multimedia. Righteous 3D is a trademark of Orchid Technologies. PowerPlayer is a trademark of Packard Bell NEC. Pavilion is a trademark of Hewlett Packard Company. Windows® is either a registered trademark or trademark of Microsoft Corporation in the United States and/or other countries. ©1997 Psygnosis Ltd.

situations where you definitely would not want to mix RAM types?

Chris Bojrab

Tech Editor Chris Dunphy replies: *Parity RAM tells you if there's a memory error—by crashing your computer. For bank computers, a crash may be preferable to having a dollar accidentally turn into a million, but for most general PC users a tiny one-bit error in memory would likely go entirely unnoticed. Who wants their entire machine to lock up and lose all unsaved work because a stray cosmic ray changed one bit in your Windows wallpaper backdrop?*

> **"As if anyone really thinks the PC version of *Tomb Raider* is better than the PSX version!"**

As a result, most new PCs no longer require parity RAM, and by going without the extra parity bit, RAM is about 10 percent cheaper.

As for RAM mixing... well, obviously you can't put an SDRAM DIMM into a DRAM socket. But you should probably be more concerned about intermixing EDO and regular DRAM. If you have EDO mode enabled in your BIOS, all of your memory must be EDO. If EDO mode is off, you can freely mix and match the two types. As for speed, if your computer wants 70ns RAM, give it any mix of RAM chips that are 70ns or faster, and you should be fine.

VESA... It's everywhere you want to be

I was wondering why VESA 2.0 is so important? What does it do? Enhance graphics?

Increase resolution? And if it does, what products (especially games) have VESA 2.0 support?

My S3 Trio video system has no VESA 2.0 support. How can add VESA 2.0 support to it?

Steve Bottari

Reviews Editor Andrew Sanchez replies: *VESA 2.0 is a standard that provides graphic modes beyond VGA. This includes resolutions such as 640x480, 800x600, 1024x768 in up to 64k colors. More importantly, VESA 2.0 allows software developers to use a faster flat-mode memory model that increases SVGA performance, compared to the traditional "banked" frame buffer. It's all about speed, speed... and speed—and VESA 2.0 provides it. Games, such as* Quake, Duke Nukem 3D, *and* The 11th Hour *are among the latest DOS games to utilize VESA 2.0—but support doesn't stop with games. Kinetix's* Animator Pro *will take advantage of it, as well.*

As far as your S3 Trio64/c764, check with your video card manufacturer's web site—they may have drivers that will make your system VESA 2.0 compatible. If they don't, take a peek at ***www.scitechsoft.com*** *for the latest version of Scitech's Universal VESA BIOS Extension (UniVBE)*

Obscene Gesture

In *boot* 05, you have a picture of Microsoft's Alex St. John holding his fist in front of his zipper. This is vulgar, suggestive, and lewd. I'm 47 years old, married, and offended.

Rich Gregory

I want my mommyboards!

I think a magazine like *boot* should review motherboards. We want to know! If you do review motherboards, please test them for more than just performance. It sounds like there are many unreliable motherboards out there. We need your help to find out the truth!

edlin

Reviews Editor Andrew Sanchez replies: *We've heard your wailing, and we aim to please. Watch for a round-up of bootWorthy motherboards in the next issue. Also, look out for a review of Tyan's new S1682D Tahoe P-PRO/Klamath motherboard down the road as well. We'll test long-term reliability, but until Dunphy perfects his Be-powered Time-Displacement device, the bootLab may have to come up with creative ways to simulate the harsh conditions a motherboard must live with 24/7.*

Speed of light

I just bought a LightSpeed 128 for $129. I made the decision because of your Kick-Ass recommendation, but after reading letters at your web site I see maybe the Millennium would have been a better Win95 accelerator. It would be nice if, when recommending products, you could more precisely compare them with other options. Regardless, the LightSpeed is a huge improvement over my ATI and at that price, I am in no way complaining. I'm using an AMD 5x86/133, 32MB of RAM, with the STB and I can play *Quake* under Win95 at several cuts above the default resolution.

Also, what about the new STB Velocity? It looks like it has it all... OpenGL, perspective, and all the 3D features you could want plus great 2D performance. I can't wait for your review. When is Matrox gonna counter with a new Millennium replacement?

Brian a.k.a. Harem King

Tech Editor Chris Dunphy replies: *The Millennium was indeed the definitive 2D Windows accelerator of last year, but unless you absolutely must crank in the highest resolution and color depth modes, the LightSpeed will do you no wrong, and it absolutely rocks for DOS games.*

The STB Velocity 3D was reviewed in boot *06. It's a decent 2D card, but the ViRGE chip powering it is sub-par for 3D gaming.*

Matrox has been quiet lately, but rumor has it that they have a new high-end 3D accelerator in the works.

MMX or Pentium Pro?

The industry is all abuzz with MMX. I'm getting ready to revamp my whole system and I have had my heart set on a Pentium Pro... until I heard about MMX. Which one is better? There will be a Pentium Pro MMX released in about 10 months (or so one vendor told me). That's a little long to wait.

Does the Pro do everything the MMX will do? Then I jump onto Intel's home page and read about the MMX Overdrive processors due out soon. Intel makes it sound like you can just upgrade your existing Pentium with an overdrive MMX. Is this true? If I get the Pro now, will I have to swap motherboards in 10 months to add MMX?

Kurt Kaufman

Tech Editor Chris Dunphy replies: *Tough choice. The current Pentium Pro does not support the MMX instruction set; and the MMX instruction set does indeed give a dramatic speed up to integer operations. The Pentium Pro on the other hand is, overall, a more advanced architecture that represents the future of the Intel line.*

So, what should you go with now? I'd get a 200MHz MMX if I were building a new system today. That should be more than enough to last a year and a half or so until Klamath motherboards and systems are cheap and plentiful.

Won't be long...

I have been developing hardware and software for many years, including products for the C64/128 to the Amiga to the PC to the Sony PlayStation and many others since way back when.... Your mag is a perfect example of how the PC is so lame.... As if anyone really thinks the PC version of *Tomb Raider* is better than the PSX version!

By the time you add up the total bill for the Pentium-based 3Dfx hardware to play *Tomb Raider*, the game console owner is howling endlessly when they only have to dish out $299. Embedded systems are the future. Set-top Internet boxes for your TV, console interactive game units, etc. The PC is doomed to be a tool, just like a phone, fax, typewriter, or file cabinet. The true PC fanatics won't be reading *boot*, they'll be playing PSX and developing for it on a PC (or better yet, the new Alpha-based Amiga).

jspusa@ix.netcom.com (JSP)

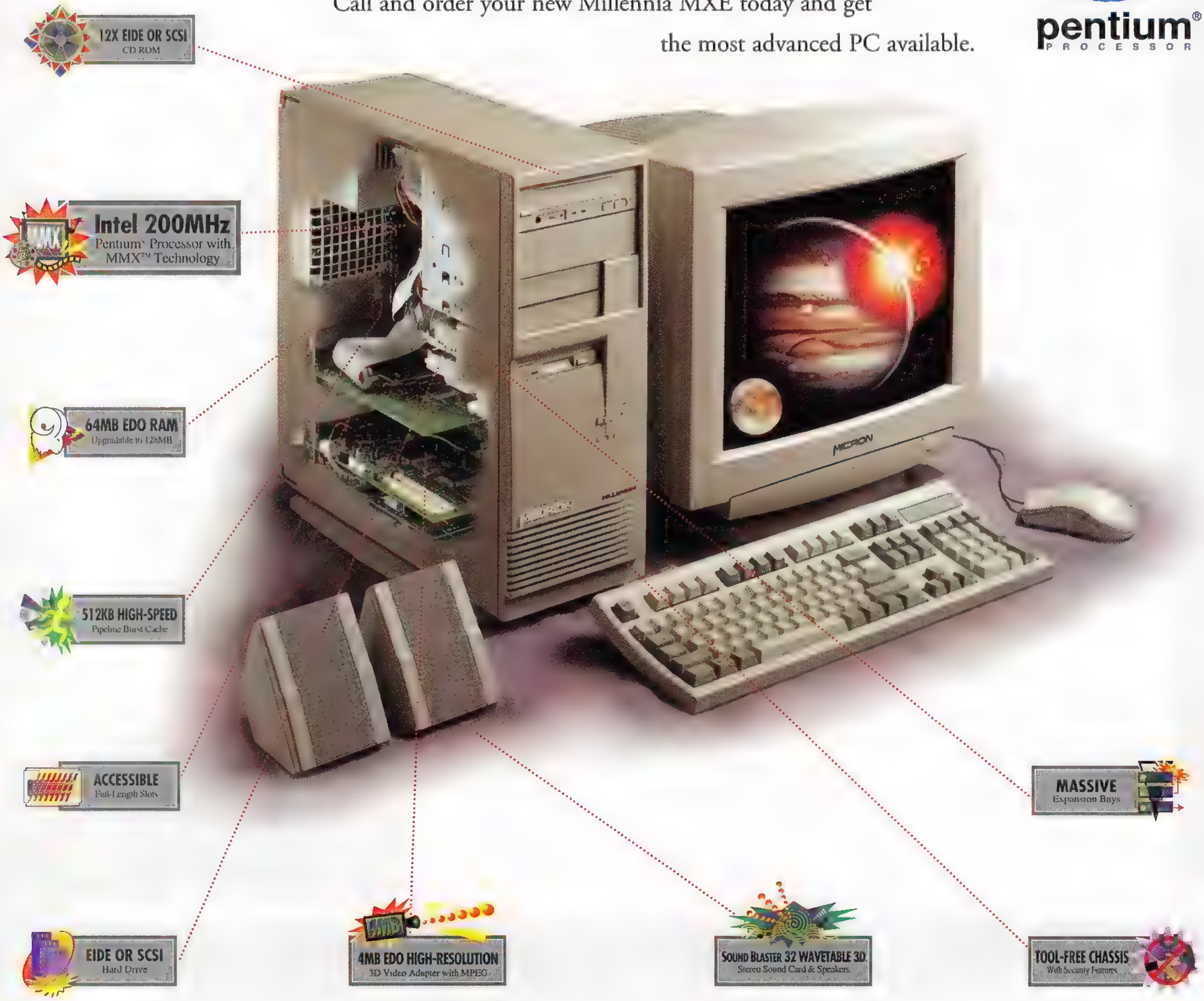
Editor In Chief Brad Dosland replies: *Where to start, where to start? Is the PC version of* Tomb Raider *better? Most certainly, and everyone except Stevie Wonder knows it. And if you're so worried about the bill for the kind of hardware required for the best gaming system, go to a flea market and pick up an Atari 2600, it's an embedded system and sounds like it's right up your alley. In the meantime, we'll just be here playing* Quake, Duke Nukem 3D, Diablo, Comanche 3, SkyNet, Daggerfall, Starfleet Academy, F-22 Lightning II, Crusader: No Regret, Z, *and all the other games that may someday—when the technology is old and gray—be ported. And keep me posted when* 3D Studio Max, Adobe Photoshop, *and* Cakewalk Pro *are ported, OK?*

e-mail: commport@bootnet.com
fax: 415.468.4686
paper: boot commport,
150 North Hill Dr., Brisbane, CA 94005

What Will PCs Be Like In The Future?

To Find Out, Look Into the Next Millennia

Now you can own a PC of the future. Micron Electronics™ has integrated its award-winning Millennia platform with the new **MMX™ technology** from Intel. Introducing the **Millennia MXE**, the latest system in the Millennia series that's perfect for the most uncompromising home or office user. The Millennia MXE delivers a significant increase in processing speed over classic Pentium-based systems, improving your productivity. Featuring the exciting new MMX technology, the Millennia MXE accelerates existing and emerging multimedia and communication software, enriches your Internet experience, and dramatically improves graphics, video and audio quality. And the Millennia MXE is fully compatible with all your existing applications. That means you don't have to upgrade your software until you're ready. Plus the Millennia MXE reduces your cost of ownership. With the MMX technology onboard, you can benefit from economical software solutions for multimedia and communication enhancements that currently require expensive hardware devices. Improve your Productivity. Experience clear, colorful graphics. Enjoy the Internet more. Call and order your new Millennia MXE today and get the most advanced PC available.


12X EIDE OR SCSI
CD ROM
Intel 200MHz
Pentium® Processor with MMX™ Technology
64MB EDO RAM
Upgradable to 128MB
512KB HIGH-SPEED
Pipeline Burst Cache
ACCESSIBLE
Full-Length Slots
MASSIVE
Expansion Bays
EIDE OR SCSI
Hard Drive
4MB EDO HIGH-RESOLUTION
3D Video Adapter with MPEG
SOUND BLASTER 32 WAVETABLE 3D
Stereo Sound Card & Speakers
TOOL-FREE CHASSIS
With Security Features
MICRON
MILLENNIA

NEW
November 1996
Millennia Pro2 400 Plus

NEW
1996 Finalist MVP PC Computing
November 1996
Millennia Pro2 400 Plus

NEW
PC Magazine Editors' Choice
June 25, 1996
Millennia P166

NEW
PC Magazine Editors' Choice
June 25, 1996
Millennia P133

NEW
PC Magazine Editors' Choice
August 1996
Millennia
TransPort P133

NEW
PC World
December 1996
Best Overall
Company

NEW
PC World
December 1996
Best Service

NEW
PC World
December 1996
Best Reliability

Readers' Choice for Customer
Service and Reliability,
1994 and 1995

PC World
February 1996
Home MPC P90

ADVANCED DESKTOP SOLUTIONS

Millennia™ MXE P166

Intel 166MHz Pentium® processor with MMX™

With Intel 200MHz Pentium processor with MMX & 32KB internal cache..........add $200

- 512KB pipeline burst cache, flash BIOS
- 12X EIDE CD-ROM drive, 3.5" floppy drive
- **100MB Iomega® Zip™ drive**
- Sound Blaster® 32 Wavetable 3D stereo sound card with speakers
- **PCI 64-bit 3D video, MPEG, 4MB EDO RAM**
- Tool-free minitower or desktop
- Microsoft® Mouse, 104-key keyboard
- Microsoft Windows® 95 & MS® Plus! CD
- MMX enabled software: Adobe® Photo Deluxe, Ubisoft Pod, Blockbuster™ Entertainment, Billboard Music Guide & Eraser Turnabout
- 5-year/3-year Micron Power℠ warranty

- **16MB EDO RAM** • 1.6GB EIDE hard drive
- 15" Micron 15FGx, .28dp (13.7" display)
- Microsoft Works 95 CDs

$1,999 Business lease $68/month

- **32MB EDO RAM** • 2.5GB EIDE hard drive
- 15" Micron 15FGx, .28dp (13.7" display)
- Microsoft Office CDs

$2,299 Business lease $78/month

- **64MB EDO RAM** • 3.1GB EIDE hard drive
- 17" Micron 17FGx, .26dp (15.8" display)
- Microsoft Office CDs

$2,899 Business lease $99/month

Millennia™ MXE P200 Plus

Intel 200MHz Pentium® processor with MMX™

With Intel 166MHz Pentium processor with MMX & 32KB internal cache..........subtract $100

- 512KB pipeline burst cache, flash BIOS
- PCI 32-bit Ultra SCSI Fast-20 controller
- 12X SCSI CD-ROM drive, 3.5" floppy drive
- **100MB Iomega Zip drive**
- Sound Blaster 32 Wavetable 3D stereo sound card with speakers
- **PCI 64-bit 3D video, MPEG, 4MB EDO RAM**
- Tool-free minitower or desktop
- Microsoft Mouse, 104-key keyboard
- Microsoft Windows 95 & MS Plus! CD
- MMX enabled software: Adobe Photo Deluxe, Ubisoft Pod, Blockbuster Entertainment, Billboard Music Guide & Eraser Turnabout
- 5-year/3-year Micron Power warranty

- **16MB EDO RAM** • 2GB Ultra SCSI hard drive
- 15" Micron 15FGx, .28dp (13.7" display)
- Microsoft Works 95 CDs

$2,899 Business lease $99/month

- **32MB EDO RAM** • 4GB Ultra SCSI hard drive
- 15" Micron 15FGx, .28dp (13.7" display)
- Microsoft Office CDs

$3,399 Business lease $116/month

- **64MB EDO RAM** • 9GB Fast SCSI-2 hard drive
- 17" Micron 17FGx, .26dp (15.8" display)
- Microsoft Office CDs

$4,999 Business lease $170/month

POWER DESKTOP SOLUTIONS

Millennia™ Pro2 180

Intel 180MHz Pentium® Pro processor

- With second Intel 180MHz Pentium Pro processor..........add $599*
- With Microsoft Windows NT® Workstation 4.0 CD..........add $99

* Second processor requires Mirosoft Windows NT Workstation 4.0

- Supports dual Intel 180MHz Pentium Pro processors
- 256KB internal L2 cache, flash BIOS
- 12X EIDE CD-ROM drive, 3.5" floppy drive
- 16-bit stereo sound & speakers
- **PCI 64-bit 3D video, MPEG, 4MB EDO RAM**
- Tool-free mini tower or desktop
- Microsoft Mouse, 104-key keyboard
- Microsoft Windows® 95 & MS® Plus! CD
- 5-year/3-year Micron Power℠ warranty

- **16MB EDO RAM** • 2.5GB EIDE hard drive
- 15" Micron 15FGx, .28dp (13.7" display)
- Microsoft Works 95 CD

$2,199 Business lease $75/month

- **32MB EDO RAM** • 3.1GB EIDE hard drive
- 17" Micron 17FGx, .26dp (15.8" display)
- Microsoft Office CDs

$2,699 Business lease $92/month

Millennia™ Pro2 400 Plus

Dual Intel 200MHz Pentium® Pro processor

- 256KB internal L2 cache, flash BIOS
- PCI 32-bit Ultra SCSI Fast-20 controller
- 12X SCSI CD-ROM drive, 3.5" floppy drive
- 16-bit stereo sound & speakers
- **PCI 64-bit 3D video, MPEG, 4MB EDO RAM**
- Tool-free mini tower or desktop
- Microsoft Mouse, 104-key keyboard
- Microsoft Windows NT Workstation 4.0 CD
- Microsoft Office CDs
- 5-year/3-year Micron Power warranty

- **32MB EDO RAM** • 2GB Ultra SCSI hard drive
- 15" Micron 15FGx, .28dp (13.7" display)

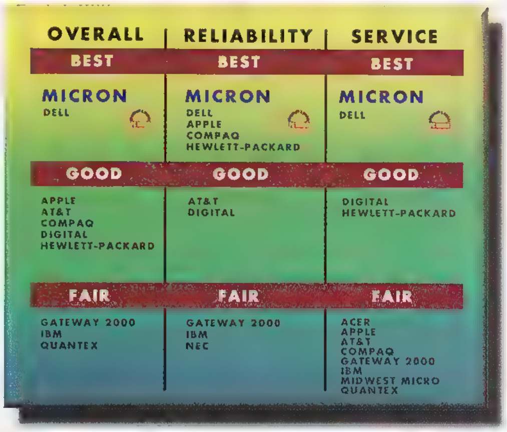
$3,899 Business lease $133/month

- **64MB EDO RAM** • 4GB Ultra SCSI hard drive
- 17" Micron 17FGx, .26dp (15.8" display)

$4,749 Business lease $163/month

- **128MB EDO RAM** • 9GB Fast SCSI-2 hard drive
- 21" Micron 21FGx, .26dp (20.0" display)

$6,999 Business lease $220/month



OVERALL	RELIABILITY	SERVICE
BEST	BEST	BEST
MICRON DELL	MICRON DELL APPLE COMPAQ HEWLETT-PACKARD	MICRON DELL
GOOD	GOOD	GOOD
APPLE AT&T COMPAQ DIGITAL HEWLETT-PACKARD	AT&T DIGITAL	DIGITAL HEWLETT-PACKARD
FAIR	FAIR	FAIR
GATEWAY 2000 IBM QUANTEX	GATEWAY 2000 IBM NEC	ACER APPLE AT&T COMPAQ GATEWAY 2000 IBM MIDWEST MICRO QUANTEX

PC World Reliability & Service Survey–*PC World Magazine*, December 1996

PENTIUM® PRO
PROCESSOR

Micron Power℠ Warranty & Support

- 5-year limited warranty on microprocessor and main memory
- 3-year limited parts-only system warranty
- 1-, 2- or 3-year optional on-site service agreement for Micron desktop systems
- 30 days of free Micron-supplied software support for Micron desktop systems
- 30-day money-back policy
- 24-hour technical support

The foregoing is subject to and qualified by Micron's standard limited warranties and terms and conditions of sale Terms and conditions of sale my vary for specific configurations. Copies of the limited warranties may be obtained on our Web site or by calling Micron.

Product Information Number 232

• 900 E. Karcher Road, Nampa, ID 83687 • Mon-Fri 6am-10pm Sat 7am-5pm (MT)

• International Sales Hours: Mon-Fri 6am-7pm (MT) • Phone: 208-893-3434 • Fax: 208-893-3424 • Purchase Order Fax: 208-893-8992

• Technical Support Available 24 Hours / 7 Days • Technical Support Phone: 888-FIX-MYPC • Technical Support E-mail: techsupport.meic@micron.com

International Sales	International Fax	Tollfree from Mexico	Tollfree from Canada	Tollfree from Puerto Rico
208-893-8970	208-893-7393	95-800-708-1755	800-708-1758	800-708-1756

MICRON™
ELECTRONICS, INC.

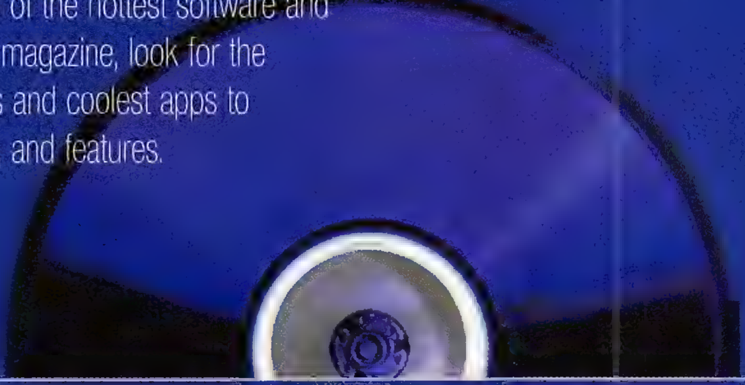
800-776-4523
http://www.mei.micron.com

©1997 Micron Electronics, Inc. All rights reserved. Micron Electronics is not responsible for omissions and/or errors in typography or photography. All purchases are subject to availability. Prices and specifications may be changed without notice; prices do not include shipping and handling. 30-day money-back policy does not include return freight and original shipping/handling charges applies only to Micron brand products and begins from date of shipment. All sales are subject to Micron Electronics' current terms and conditions of sale Lease prices based on 36-month lease The Intel Inside Logo and Pentium are registered trademarks and MMX is a trademark of Intel corporation. Microsoft, Windows, Windows NT and the Windows logo are registered trademarks and of Microsoft Corporation. All other service marks, trademarks and registered trademarks are the property of their respective companies. BOOT9702-0114

boot DISC

SEVEN

Every month, ***boot*** magazine delivers 600+MB of the hottest software and exclusive demos. If it piques your interest in the magazine, look for the ***bootDisc*** logo and you'll find the fattest demos and coolest apps to complement our cutting-edge previews, reviews, and features.



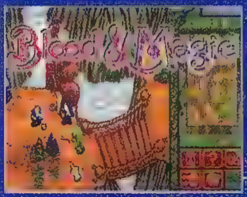
Demos:

Win95. DirectX 2.0 installer included. Contains level one of the game. By Activision. **See the review on page 98.**

MACROMEDIA
FREEHAND 7

Win95. Demo is a save-disabled version of the full application. By Macromedia. **See review on page 85.**

DOS. Demo is a limited version of the game and includes network play. By Interplay. **See the review on page 104.**


Blood & Magic

DOS. Demo includes in-depth tutorial and a complete campaign from the full version. By Interplay. **See the review on page 104.**

JETFIGHTER III

DOS. The demo has four "time-limited" mission fragments that run from two to four minutes. By Interplay. **See the review on page 84.**

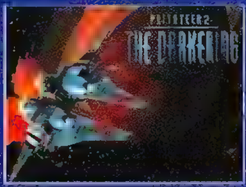
Win95. Requires DirectX 2.0 or better. Demo limited to Sawgrass 14th hole. By Electronic Arts. **See the review on page 76.**

DAYTONA USA

Win95. Requires DirectX 2.0 or better. Demo contains one track. By Sega. **See the review on page 96.**

Leisure Suit Larry

Windows. Demo is limited to a strip poker match with another crew member. By Sierra On-Line. **See the review on page 102.**


PRIVATEER 2
THE DARKENING

DOS. Demo is a limited version of the game and doesn't run properly in a virtual DOS environment. By Origin Systems. **See review on page 69.**

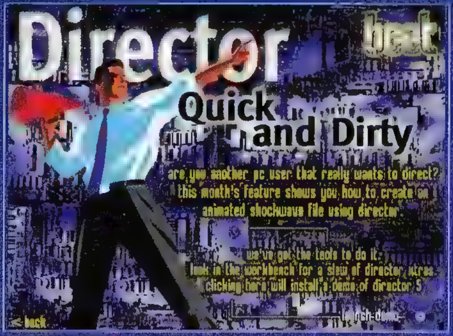
DESTRUCTION DERBY 2

DOS. Demo includes one Wrecking Racing track and limited control options. By Psygnosis. **See the review on page 88.**

DOS. Demo allows you to play the front 9 holes at Latrobe with Arnold Palmer. By Access Software. **See the review on page 76.**

Version 2.0 for Windows
ARCSOFT
PhotoStudio

Windows. This evaluation version of the full application expires in 30 days or after 100 uses. By ArcSoft. **See the review on page 98.**



are you another pc user that really wants to direct? this month's feature shows you how to create an animated shockwave file using director.

we've got the tools to do it. look in the workbench for a slew of director xtras. clicking here will install a demo of director 5

Feature: Director, Quick and Dirty
To complement our how-to feature, we have a *Director* app demo on this month's *bootDisc*, along with gobs of *Director* plug-ins to allow you to do it along with the article. This screen plugs you in to all the multimedia power.

Win95. Requires DirectX 2.0 or better. Demo limited to three career cities and one user city. By Maxis. **See the review on page 85.**

Win95. DirectX 2.0 installer included. Demo allows you to play two holes on two courses. By Maxis. **See the review on page 76.**

VRealm Builder

Win95. This evaluation version of the full application self-destructs after 30 days. By Integrated Data Systems. **See review on page 101.**

Win95. Requires DirectX 2.0 or better. The demo is a limited version of the game. By SSI. **See the review on page 104.**

www.bootnet.com

bootNet sports many of the exciting features that make *boot* magazine such a valuable resource for the hardcore PC enthusiast. There are reviews and previews, bootWorthy products, and an expanding archive of articles from past issues of *boot* online for easy reference, complete with a search engine.

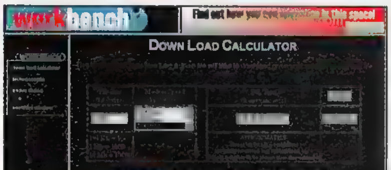
Thinking of upgrading the dog-slow 486 you've used since college to a faster, sexier 200MHz Pentium screamer? Like most consumers, you're afraid the moment you drop the three long this takes, the new system will be obsolete in six months. Well, guess what... you're right! But, fortunately for you, *boot*'s here to point out wise purchases that will last you longer than the current issue of *TV Guide*.

Check out the *bootNet* site. We have past reviews and previews, and a bootWire news section that's updated daily with the hottest news in the computer industry. Feel like telling us what's on your mind? The Letters to the Editor column is now threaded, so you can respond to Joe Shmoe's ridiculous statement, or wholeheartedly agree with him.

When you show up at the *bootNet* site, make sure you're sporting the rudimentary 800x600 resolution with at least 16-bit color, and a fully capable JavaScript browser (we recommend *Netscape Navigator v3.0*). The *bootNet* site is also graphics intensive, so if you have access to a T1, use it. If not, there's a text version menu that will help speed things up for you.

bootLive
Everybody has 'em. Well, now we do too! The bootLive camera is automatically updated every few minutes, so you can see your favorite bootBoyz and bootGrrlz running around working hard to put together the magazine you crave each month.

WorkBench
Check out these cool JavaScripts; they'll help make your web navigation experience a smooth one.



The *bootDisc* is compatible with both Windows 95 and 3.x. Run start95.exe to launch under Win95, and start31.exe under Win3.1. *boot* recommends a Pentium 90 or better with 16MB for access to all the software that's included. Slam the *bootDisc* into your CD-ROM drive to give yourself an injection of Pure PC Power.

they never attack in hor... seen in

"The Vanguard of a terrifying new level of immersive technology."

—COMPUTER GAMING WORLD

his ...
by the lightning ...

"...by far the most addictive, multiplayer action game we've ever played."

Quake's greatest addition ... levels feature some form ... which ... If you

—PC MAGAZINE

... furious as it ... be disappointed th... shots ...
Deathma... ever was in *Doom*, but much harder. In fact, if

"Quake overwhelms the senses."

—USA TODAY

... world is ca... run so slowly. But, thank... Universe ... enemy departme...

"Quake is the biggest, baddest, bloodiest and most atmospheric 3-D action game ever conceived."

—PC GAMER

... gameplay, *Total Mania* is a ...
... on the bigger levels there's mo... ring than robot-shooting, which, let's fa...

"Quake is the most satisfying first-person action game of all time."

—BOOT MAGAZINE

that you can target an enemy robot and fire at it ... because these can be sold when you get back ... converted into valuable credits. terra... *Total*... empha... add a...

PLAY IT ten ONLINE
www.ten.net

id
www.idsoftware.com

GT™
Distributed by
GT Interactive Software
www.gtinteractive.com

Quake™ ©1996 Id Software, Inc. All Rights Reserved. Published by Id Software, Inc. Distributed by GT Interactive Software Corp. MS-DOS® is a registered trademark of Microsoft Corporation. All other trademarks are the property of their respective companies.

Product Information Number 320

QUAKE
full registered version
now available.

Post Office Announces Secure e-mail

If the U.S. Postal Service has its way, you'll soon be charged for sending e-mail via the Internet. The proposal suggests that the Postal Service charge a nominal fee for consumers and business customers who want to send bulk e-mail or send e-mail with priority handling (just like a certified letter).

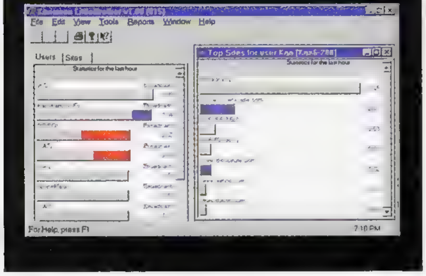
A system is also being developed to verify the identity of e-mail senders, who will have to preregister a digital signature with the post office so it can be compared against any e-mail sent or received. Eventually, you'll be able to register a change of address with the post office over the Internet, too. No word yet, about how much these services will cost.

Work *is* Hell

The Internet can be a valuable business tool, but it can also cost businesses thousands of hours in lost productivity. In fact, according to a DVD Software press release (makers of *AntiGame*, a nasty software utility that searches out and eliminates up to 6,096 games from local drives and network computers), "the annual cost of games at work, in terms of lost productivity, in the United States alone, is estimated to be 50 billion dollars."

So, to force you to become more productive, Kansmen Corporation has introduced *LittleBrother*, a network and Internet/Intranet tracking, monitoring, and blocking software utility that allows administrators to track where employees go on the net, how long they stay, and which programs they download.

The software alerts administrators of excessive unproductive usage and allows the blocking of web sites, online games, and chat rooms, and even configures and categorizes web sites as productive or unproductive. They should've called it Big Bully instead.


File Edit View Tools Reports Window Help
Users
Sites
Statistics for the last hour
Top Sites for user Kaa [7.aa6-788]
Statistics for the last hour
For Help, press F1
7:10 PM

Flying Elvis

SPOT, the world's first commercial Earth observation satellite system, has been providing satellite images and other geographical information for more than 10 years. Using these same U.S. Geographical Survey data sources, SPOT ElVis (elevation/visualization) terrain elevation data sets covering the United State are now available for use in flight simulation, wireless network planning, cartography, and computer entertainment.

Information is available in one arc second or 30-meter elevation postings for any area of the United States, and can be delivered with corresponding SPOT satellite data coverage including radar imagery, digital aerial photographs, digital land-cover maps, and elevation models.

Strawberry Fields Blowing in the Wind

Former Beatles' member, Paul McCartney, and his lovely wife, Linda, are working on a new film about the Liverpool Lads using computer technology to turn still photographs into moving pictures. According to Beatles' spokesman Geoff Baker, "Paul and Linda are currently editing through some 4,000 of Linda's Beatles pictures"—none of which have ever been seen by the public—"in order to make the new style of movie, which they call a photofilm." Linda took the photographs between 1967 (when she met Paul) and 1970 (when the group disbanded).

American SINGLES

Singled Out

Don't spend another Valentine's Day alone with your dog. American Singles, the world's largest non-profit dating service, has launched a new site on the World Wide Web to help you find that perfect partner. The Singles Channel (**www.as.org**) incorporates an extensive database containing profiles and photographs for more than 45,000 members. You can search the database for specific criteria and desires, including height, location, and hobbies; and communicate with members by e-mail or fax.

The Singles Channel also features multiple JavaTalk chat rooms, divided into age groups and sexual preferences. The Singles Channel is also sponsoring the national U.S. tour of the "School of Flirting," where you'll learn how to be the world's biggest flirt for only $15.

Internet U

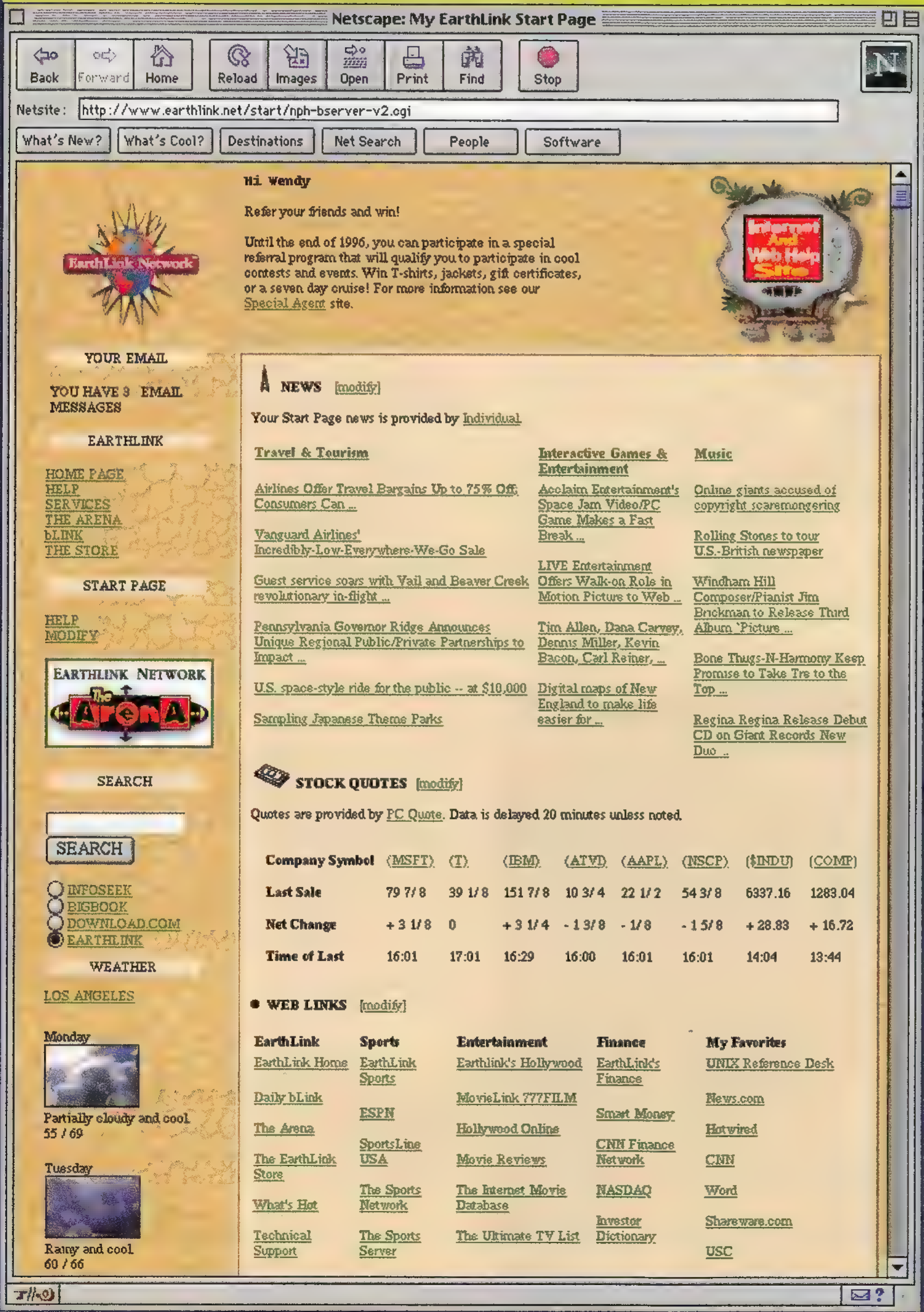
Students around the globe or across town can now access 114 credit, non-credit, and degree courses via their computers through New York's New School Distance Instruction for Adult Learning (DIAL) program. Established in 1994 with only seven courses, DIAL has grown to offer dozens of courses in 20 departments ranging from music and writing, to business and communications. Plus, students who have already earned 60 credits toward a Bachelor of Arts degree can now complete their degree *entirely* online.

The New School

Each DIAL course is taught by New School faculty members who provide lectures, assess student work, and give assignments. Course information is available at **www.dialnsa.edu**.

Are you the kind of person who always wants everything your own way?

EarthLink's Internet access now includes your Personal Start Page.



Netsite: http://www.earthlink.net/start/nph-bserver-v2.cgi

Hi Wendy

Refer your friends and win!

Until the end of 1996, you can participate in a special referral program that will qualify you to participate in cool contests and events. Win T-shirts, jackets, gift certificates, or a seven day cruise! For more information see our Special Agent site.

YOUR EMAIL

YOU HAVE 3 EMAIL MESSAGES

EARTHLINK

HOME PAGE
HELP
SERVICES
THE ARENA
bLINK
THE STORE

START PAGE

HELP
MODIFY

EARTHLINK NETWORK The ArenA

SEARCH

SEARCH

○ INFOSEEK
○ BIGBOOK
○ DOWNLOAD.COM
● EARTHLINK

WEATHER

LOS ANGELES

Monday
Partially cloudy and cool
55 / 69

Tuesday
Rainy and cool
60 / 66

NEWS [modify]

Your Start Page news is provided by Individual.

Travel & Tourism

Airlines Offer Travel Bargains Up to 75% Off; Consumers Can ...

Vanguard Airlines' Incredibly-Low-Everywhere-We-Go Sale

Guest service soars with Vail and Beaver Creek revolutionary in-flight ...

Pennsylvania Governor Ridge Announces Unique Regional Public/Private Partnerships to Impact ...

U.S. space-style ride for the public -- at $10,000

Sampling Japanese Theme Parks

Interactive Games & Entertainment

Acclaim Entertainment's Space Jam Video/PC Game Makes a Fast Break ...

LIVE Entertainment Offers Walk-on Role in Motion Picture to Web ...

Tim Allen, Dana Carvey, Dennis Miller, Kevin Bacon, Carl Reiner, ...

Digital maps of New England to make life easier for ...

Music

Online giants accused of copyright scaremongering

Rolling Stones to tour U.S.-British newspaper

Windham Hill Composer/Pianist Jim Brickman to Release Third Album `Picture ...

Bone Thugs-N-Harmony Keep Promise to Take Tre to the Top ...

Regina Regina Release Debut CD on Giant Records New Duo ...

STOCK QUOTES [modify]

Quotes are provided by PC Quote. Data is delayed 20 minutes unless noted.

Company Symbol	(MSFT)	(T)	(IBM)	(ATVI)	(AAPL)	(NSCP)	($INDU)	(COMP)
Last Sale	79 7/8	39 1/8	151 7/8	10 3/4	22 1/2	54 3/8	6337.16	1283.04
Net Change	+ 3 1/8	0	+ 3 1/4	- 1 3/8	- 1/8	- 1 5/8	+ 28.83	+ 16.72
Time of Last	16:01	17:01	16:29	16:00	16:01	16:01	14:04	13:44

● **WEB LINKS** [modify]

EarthLink	Sports	Entertainment	Finance	My Favorites
EarthLink Home Daily bLink The Arena The EarthLink Store What's Hot Technical Support	EarthLink Sports ESPN SportsLine USA The Sports Network The Sports Server	Earthlink's Hollywood MovieLink 777FILM Hollywood Online Movie Reviews The Internet Movie Database The Ultimate TV List	EarthLink's Finance Smart Money CNN Finance Network NASDAQ Investor Dictionary	UNIX Reference Desk News.com Hotwired CNN Word Shareware.com USC

1 **STYLIZE** Choose how your page looks and what goes on it.

2 **GOT E-MAIL?** We'll tell you as soon as it comes in.

3 **NEWS** Select from 25 categories you're interested in and we'll gather it for you from over 700 sources.

4 **STOCK QUOTES** Watch your wallet fatten with your choice of stock quotes updated by PC Quote.

5 **PREMIUM CONTENT** Enjoy discounted rates and direct links to services from Quote.com, CompuServe® and others.

6 **WEATHER** Find out if you need shades or a scarf, with a 4-day local forecast.

7 **WEB LINKS** Select personal links to your favorite Web sites so they're only one click away.

8 **WEB SEARCH** If it's not on your Start Page, use a keyword to search the Internet to find exactly what you're looking for.

EarthLink Network

It's *your* Internet™

Product Information Number 130

Unlimited Internet $19.95 a month
Your Personal Start Page
Toll free 24-hour help line
call 1-800-395-8425

All the goodies you expect... and more! Personal Start Page   Netscape Navigator™   E-Mail   Newsgroups   Free Website   Multiplayer Gaming   Over 500 Dial-up numbers   24/7 Help 800#   Chat   ISDN   Business Solutions   National Frame Relay   The Net "A"- Rated   Pournelle's Choice   Yahoo Best   Free software package for Win3.1™, Win95™ and Mac®

©1997 EarthLink Network, Inc. Trademarks are property of their respective owners. All rights reserved. EarthLink Network, Inc.
3100 New York Drive, Pasadena, CA 91107

DirectX Under Attack

Quake creator frags Microsoft's 3D Technology

id's John Carmack (above) faces off with Microsoft's Alex St. John on the issue of DirectX.

Fast on the heels of *boot*'s two-part Lip interview with Microsoft's Alex St. John (*boot* 05 and *boot* 06) comes word that major problems with DirectX have surfaced, including version incompatibilities, major bugs, closed APIs, and worse, developer defections.

In a public statement on the web (**www.bluesnews.com** or finger **johnc@idsoftware.com**) and e-mail to *boot*, id's John Carmack (in explaining why there will be an OpenGL version of *Quake*, but there won't be a Direct3D version) blasts Microsoft, DirectX, and Direct3D, all the while extolling the virtues of OpenGL.

Carmack believes there are two viable contenders for low-level 3D programming: Direct3D, part of Microsoft's games SDK; and OpenGL, the workstation graphic API originally developed by SGI. Although both standards are supported by Microsoft, Carmack believes OpenGL to be a substantially better API, and has decided not to finish the Direct3D port of his best-selling *Quake*, claiming he has better things to do with his time.

According to Carmack, "Direct3D is a horribly broken API. It inflicts great pain and suffering on the programmers using it, without returning any significant advantages." Carmack also states that while "Microsoft's position is that Direct3D is for games and low-end applications, OpenGL is for CAD/modeling and high-end applications. There is no value to be gained through Direct3D, which is just another (inferior) way of doing the same thing that OpenGL has been doing for years."

> "Direct3D is a horribly broken API. It inflicts great pain and suffering on the programmers using it, without returning any significant advantages." *—John Carmack*

And, lest you think Carmack is alone in this thinking, grumblings about DirectX have been heard from other developers, ever since Microsoft introduced the API at the Computer Game Developers' Conference in April 1995. One of the major problems was that every time you installed a new game, a different version of DirectX would also be installed. The problem, however, was that many times your current video and audio drivers were replaced with incompatible drivers, rendering your system a shuddering mess of incompatible components.

If you check out the Microsoft development web site, you'll be greeted with fixes correcting display driver problems, visual artifacts on MMX machines, sound card incompatibilities, and OSR2 driver problems. It's bad enough that game developers have to endure these problems, but it's worse when consumers have to as well. It remains to be seen if any other developers will join Carmack on the soapbox. If not, at least Carmack has made his point stating: "Microsoft is making a mistake that is going to hurt the 3D games industry for many years to come."

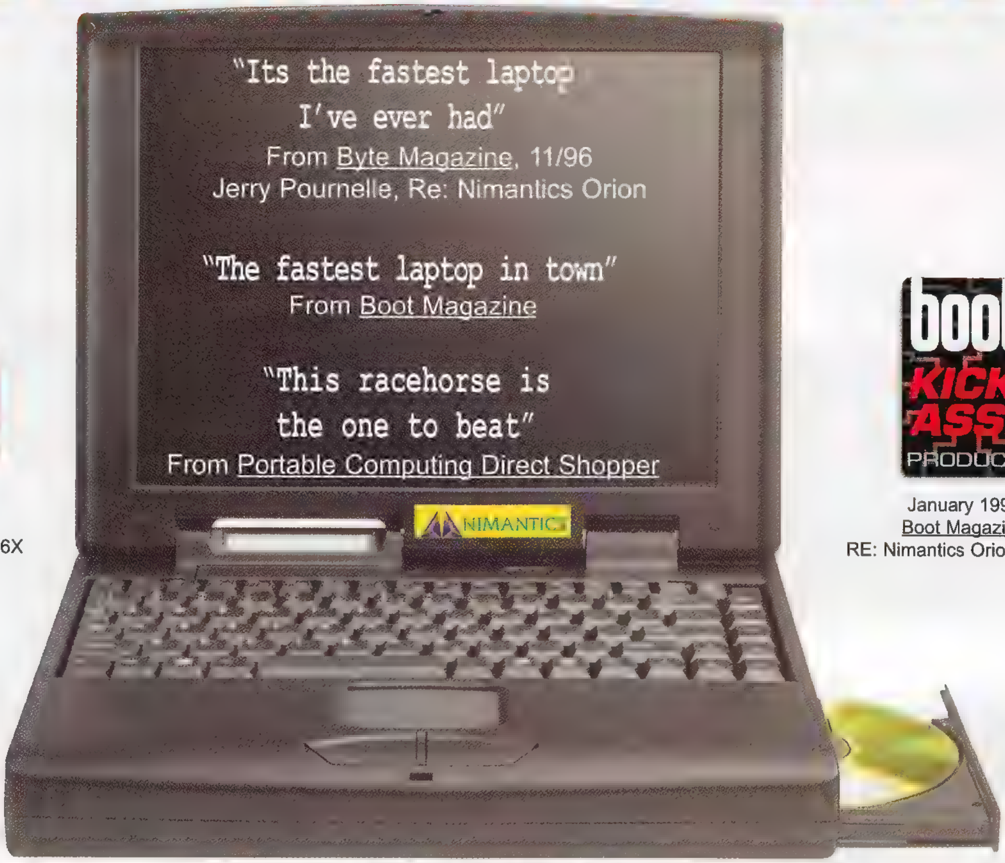
Microsoft's Alex St. John was unavailable for comment.

— *Bryan Del Rizzo*

To fix the bugs and incompatibilities of previous DirectX versions, Microsoft has released DirectX 3.0a, included on this month's *bootDisc*. To install version 3.0a, go to the Workbench section of the *bootDisc*. The new drivers can be found in the disc's Survival section .

In Computers,

SPEED IS EVERYTHING.



"Its the fastest laptop I've ever had"
From Byte Magazine, 11/96
Jerry Pournelle, Re: Nimantics Orion

"The fastest laptop in town"
From Boot Magazine

"This racehorse is the one to beat"
From Portable Computing Direct Shopper

boot KICK ASS! PRODUCT
November 1996
Boot Magazine
RE: Nimantics Orion 6X

boot KICK ASS! PRODUCT
January 1997
Boot Magazine
RE: Nimantics Orion 8X 200

Nimantics Orion 8X-200

intel inside
pentium® PROCESSOR

Orion Series Specifications

- Genuine Intel 200 MHz Pentium® Processor (133,166,200MHz available)
- 12.1" Super VGA Active Matrix Color Screen (12.1" SVGA) (Dual Scan Screen available)
- 48 MB EDO RAM (exp. to 72MB MAX)
- 256 KB Pipeline Burst Cache RAM
- 2.1 GB User Removable Hard Drive
- Simultaneous Internal 8X CD-ROM and
- 3.5" 1.44MB Floppy Drive
- 1 MB Wavetable Sound (with built in 16 bit FM Synthesizer Stereo Sound)
- Built-In 16.7 Million Color Hardware MPEG
- Zoomed Video Card Socket
- 64 Bit PCI Bus Video with 2 MB Video RAM
- Fully PCI Bus Plug'n' Play System
- 2 Internal DR-36 Batteries
- 3 PCMCIA Slots
- Windows 95 Installed (Original CD Included)
- Deluxe Carrying Case
- Life Time Niman-Tech Certified Customer Care

You demand ***SPEED***. Pure and simple. When top ***SPEED*** is the order of the day, the Orion is the laptop to beat. Period. Fueled by a ***200*** MHz Pentium® Processor and supercharged with EDO RAM, ultrafast pipeline burst, a 64 Bit Video BUS and a hardware MPEG chip, the Orion leaves the competition in the dust.

Why get stuck looking at the hourglass when your ***"KICK ASS"*** Orion 8X is only a phone call away?

Product Information Number 252

CERTIFIED CUSTOMER NIMAN TECH CARE

Niman-Tech Certified Customer Care™
is our industry leading Service and Support Program, included standard with every system we sell. Call your sales rep today for more details.

NIMANTICS
TOMORROW AND BEYOND

Nimantics Direct Order Hotline
800-646-5005
(TOLL FREE IN US CANADA)
http://www.nimantics.com/

VISA

Hours: 7a.m. to 6 p.m. PDT, M-F 8:30 to 3:30PM Sat
NEW EXTENDED HOURS
Outside U.S. Phone: (714) 440-8160
Fax Your Quote Request to: (714) 440-8170 (24 Hours)
Corporate Leasing Available through Nimantics Direct

Award Winning Products / World Class Service

©1996 Nimantics Incorporated. All rights reserved. The intel logo is a registered trademark of Intel Corporation. Windows 95 is a registered trademark of Microsoft Corporation. All other trademarks and registered trademarks are property of their respective corporations. All prices are subject to change without notice or obligation. This is a limited time offer. One year parts and labor warranty requires shipping at customers expense. Actual product may vary.
★All returns require a Return Merchandise Authorization Number from Nimantics All returns subject to Nimantics' Inspection. Return shipping at customer's expenses. Shipping charges are not refundable All shortages/damages will be charged to customer at FULL list price. Open software is non-returnable.

PURE ONLINE POWER!

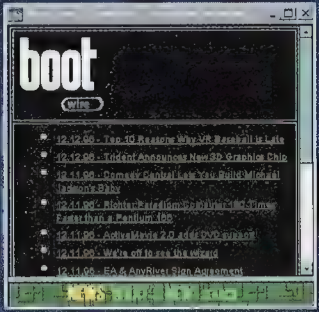
Check Out boot on the Web

WARNING
THIS SITE CONTAINS
GRAPHIC MATERIAL
THAT MAY TURN YOUR
LOVE OF PCs INTO
AN OBSESSION

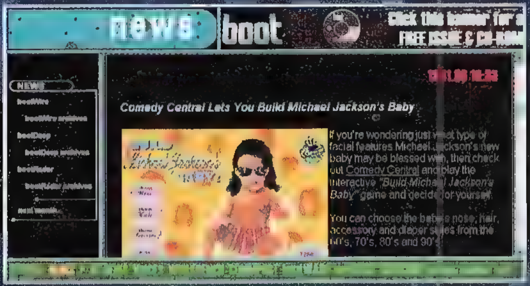
bootNet
FREE!
GAMER
CLICK HERE
boot
LUST LIST

bootNet sports many of the exciting **features** that make ***boot*** magazine such a valuable resource for the hardcore ***PC*** enthusiast.

bootLink: bootSearch Engine
words describing a concept or
keywords you wish to find information about
eXcite Search



- 12.12.96 - Top 10 Reasons Why VR Baseball is Late
- 12.12.96 - Trident Announces New 3D Graphics Chip
- 12.11.96 - Comedy Central Lets You Build Michael Jackson's Baby
- 12.11.96 - [illegible] Faster than a Pentium 166
- 12.11.96 - ActiveMovie 2.0 adds DVD support
- 12.11.96 - We're off to see the wizard
- 12.11.96 - EA & AnyRiver Sign Agreement

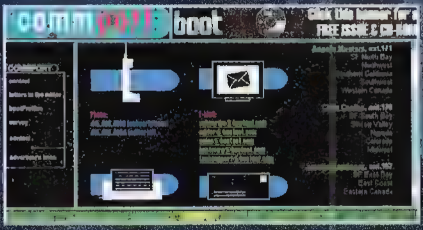

news
boot
Click this banner for a FREE ISSUE & CD-ROM

Comedy Central Lets You Build Michael Jackson's Baby

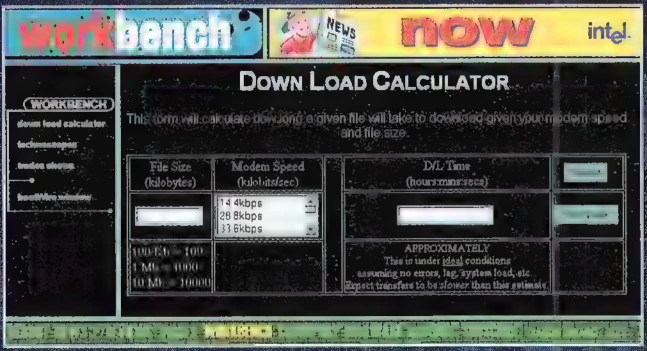
If you're wondering just what type of facial features Michael Jackson's new baby may be blessed with, then check out Comedy Central and play the interactive *"Build Michael Jackson's Baby"* game and decide for yourself.

You can choose the baby's nose, hair, accessory and diaper styles from the 60's, 70's, 80's and 90's.

p/reviews
Find out how you


commport
boot
Click this banner for a FREE ISSUE & CD-ROM

There are **reviews** and **previews**, **bootworthy products**, and *boot* **articles** from past issues online for easy **reference**, complete with a search **engine**.


workbench
NEWS
now
intel
WORKBENCH

DOWN LOAD CALCULATOR

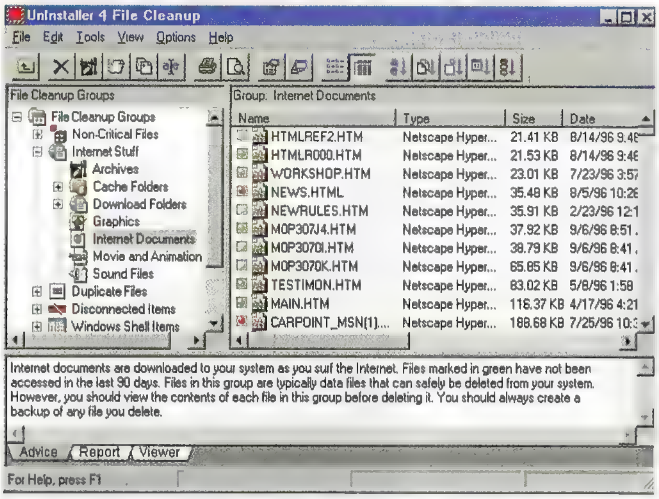
This form will calculate how long a given file will take to download given your modem speed and file size.

File Size (kilobytes)	Modem Speed (kilobits/sec)	D/L Time (hours:mins:secs)
	14.4kbps 28.8kbps 33.6kbps	
100 Kb = 100 1 Mb = 1000 10 Mb = 10000		APPROXIMATELY This is under ideal conditions assuming no errors, lag, system load, etc. Expect transfers to be slower than this estimate.

bootNet

www.bootnet.com

REBOOT NEWS P/REVIEWS VOICES FEATURES COMMPORT bootWARE bootDISC SUBSCRIBE



Group: Internet Documents

Name	Type	Size	Date
HTMLREF2.HTM	Netscape Hyper...	21.41 KB	8/14/96 9:4
HTMLR000.HTM	Netscape Hyper...	21.53 KB	8/14/96 9:4
WORKSHOP.HTM	Netscape Hyper...	23.01 KB	7/23/96 3:5
NEWS.HTML	Netscape Hyper...	35.48 KB	8/5/96 10:2
NEWRULES.HTM	Netscape Hyper...	35.91 KB	2/23/96 12:1
MOP307J4.HTM	Netscape Hyper...	37.92 KB	9/6/96 8:51
MOP3070I.HTM	Netscape Hyper...	38.79 KB	9/6/96 8:41
MOP3070K.HTM	Netscape Hyper...	65.85 KB	9/6/96 8:41
TESTIMON.HTM	Netscape Hyper...	83.02 KB	5/8/96 1:58
MAIN.HTM	Netscape Hyper...	116.37 KB	4/17/96 4:21
CARPOINT_MSN(1)....	Netscape Hyper...	188.68 KB	7/25/96 10:

Internet documents are downloaded to your system as you surf the Internet. Files marked in green have not been accessed in the last 90 days. Files in this group are typically data files that can safely be deleted from your system. However, you should view the contents of each file in this group before deleting it. You should always create a backup of any file you delete.

MicroHelp's *UnInstaller 4* is integrated into OS/2 Warp 4 to make file management clean-up quick and painless.

Is OS/2 dead?

Not according to IBM

You've heard the rumors. You've read the published reports in several industry magazines and trade journals stating that IBM has fired the entire OS/2 development team, and halted further OS/2 development. So, with IBM celebrating OS/2's 10th anniversary this year, is IBM ready to declare OS/2 dead?

"Absolutely not," says John Albee, OS/2 Warp Program Manager for IBM. "In fact, 1996 was a really big year for us."

One of the problems facing IBM (and ultimately OS/2) is Microsoft's dominance in the home market. The introduction of Win95 and WinNT, and their acceptance by the majority of business and home consumers, has left OS/2's survival in doubt. Still, last September, IBM released OS/2 Warp 4, a secure client operating system, integrating connectivity, JavaVM (Virtual Machine), and speech capability. And, although Microsoft plans to incorporate full-USB support in new retail versions of Win95 later this year, IBM isn't ready to give a date as to when similar support might be integrated into OS/2.

IBM believes OS/2 to be a viable solution for the home, but their main marketing focus has been targeted toward the corporate and business user, and not the home user. IBM also admits OS/2 wasn't developed specifically to play games, even though games are the driving force behind many new PC technologies.

"We're still working with various hardware manufacturers to ensure compatibility, but we're not as focused on having rich, stereophonic sound for instance, that a game player would be interested in," says Albee. "In terms of future uses, we're more prone to look at business uses of multimedia to provide richer content."

Recently, a joint development between Netscape and IBM resulted in a speech-enabled OS/2 version of *Netscape Navigator*. With *VoiceType Connection NS* software (free if downloaded), voice commands embedded into both *Navigator* and OS/2 desktop applications allow you to easily navigate the net, access various web links, and create text documents or e-mail messages by dictation alone.

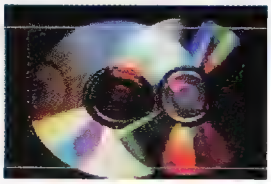
OS/2 Warp 4 is also the first commercial operating system to incorporate Sun Microsystems' Java technology (a Java development kit is also included), allowing you to run Java applications or applets natively from the desktop, independent of a browser. If Java becomes an industry standard, consumers could conceivably choose operating systems based on applications. There's no clear indication however, whether Java can or will supplant Win95 or Windows NT, even if IBM thinks differently.

"Java is an industry standard—that's happening today—so we're not too worried about that," says Albee. "What we *are* concerned about is that instead of there being one open implementation of Java, it will become splintered into several versions—like Unix—which would defeat the whole purpose of Java. I am confident that history won't repeat itself."

As for Win95 or DirectX compatibility, there is none, and don't expect any either. "We don't have Win95 compatibility," says Albee. "We currently run all the DOS, Windows 3.1, and OS/2 applications, but we have no intention of being any more of a Windows clone than that." Albee concluded by saying, "There will *not* be a Win95 compatible version of OS/2 coming out. We believe that in the next year or two years, Java is going to sweep the world and hardware platforms, and to tie oneself to an application platform such as Win95 would be a major mistake."

— *BDR*

> "There will not be a Win95 compatible version of OS/2 coming out." —*John Albee*



Microsoft Outlines DVD Support

Microsoft has finally disclosed their strategy for supporting DVD—via device and class drivers—in future versions of Win95 and Windows NT.

"DVD enables a whole new class of software applications. We are committed to providing support in both Windows and Windows NT via our Win32 Driver Model class drivers and ActiveMovie," says Moshe Dunie, vice president of the Windows operating system division at Microsoft.

Microsoft claims this move will greatly reduce the burden of device driver development, and will ultimately provide a more stable operating platform. Based on development of the Win32 Driver Model Streaming Class Driver, DVD decoder board manufacturers will then be able to write a single driver that will work in both Win95 and NT.

Microsoft is also developing a DVD supported universal disc format (UDF) file system with support for the writable DVD standard planned for a later release date.

DVD support is also being integrated into the ActiveMovie 2.0 API, providing support for many DVD capabilities including MPEG-2 video and high-quality audio playback. In addition, the ActiveMovie 2.0 interface will allow any application to fully control DVD playback, including: nonlinear video playback; interlaced video media types; audio media types with more than two channels; and user interaction such as parental control, multiple languages, and closed captioning. Microsoft will also utilize the DirectDraw hardware abstraction layer (HAL) with Video Port Extensions to provide support for MPEG-2 decoding hardware.

pure lust

HIGH-TECH **TOYS** AND **TOOLS** WITH THE RIGHT STUFF

Surrounding the sound

Aiwa's **CSD-MR1** boom box features a design innovation that yields a unique surround-sound experience. The CD/radio/cassette recorder is perfectly round, with a six-speaker configuration that pumps out audio from all sides. Weighing in at nine pounds, four ounces, the $185 stereo is ideal for picnics. Just sit the unit in the middle of the blanket and gather 'round. When the sun sets, groove to the LEDs circling each speaker—the colored lights flash to the beat. Seriously.

Aiwa America: 800.289.2492; www.aiwa.com

OLYMPUS
∞Stylus
ZOOM 105

Point and click

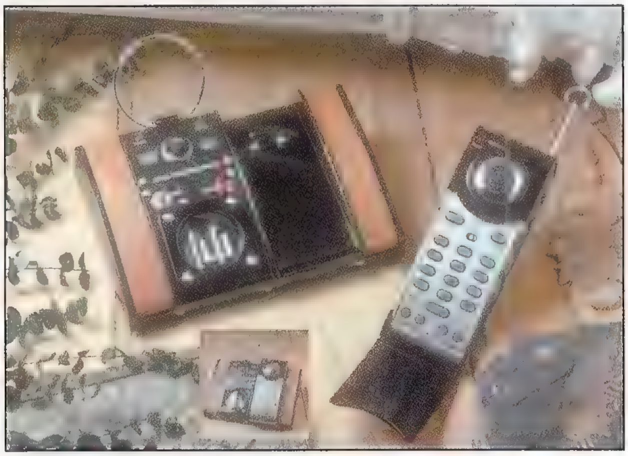
Don't waste money on overpriced disposable cameras. Olympus's **Infinity Stylus Zoom 105 DLX** is a tiny automatic zoom camera. The 4.75-inch-wide camera features a 3X zoom lens that ranges from wide-angle 38mm to 105mm telephoto, and a pop-up flash system designed to reduce red eye. Without the 3V lithium battery, the $349.95 Stylus Zoom 105 DLX weighs 8.5 ounces. Keep it in your pocket and you'll never miss another photo op.

Olympus: 800.645.8130; www.olympus.com

Wherever you go, there you are

Bike trekker? Bigfoot hunter? Lousy sense of direction? Garmin's **GPS II** is a tiny, versatile GPS receiver that reports your location anywhere on planet Earth, including travel speed, distance, and bearing. The 5x2.3-inch unit weighs only nine ounces, including four AA batteries that deliver 15 to 20 hours of use. The $386.35 device can be mounted on a car dashboard or simply carried in your pocket. Install the optional brackets and you can even attach it to your bicycle's handlebar. The "flip-flop" display can be read vertically or horizontally. Finally, you can quit leaving a trail of popcorn when you trek into the back country: The TracBack feature enables you to trace your steps by recording your track log history.

Garmin: 913.397.8200

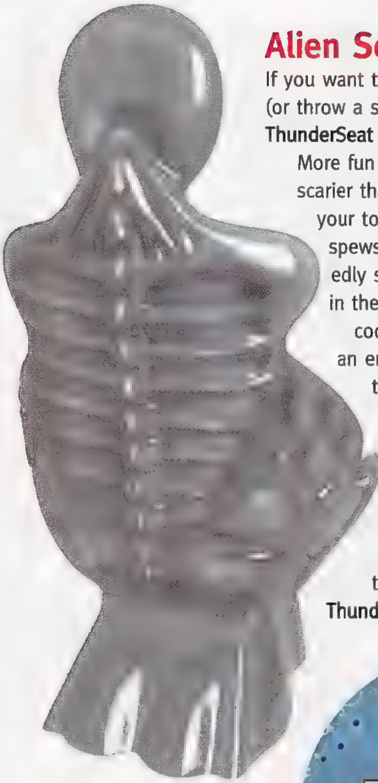


Field fone

Retro fetishists, this one's for you. Distinctly styled after a military field phone from the 1920s, the $129.95 **Spirit of St. Louis** cordless phone is built from wood veneer, plastic, and aluminum. Select from 25 channels to avoid interference and the channel number appears in display tubes on the base. The circle antennas probably don't improve reception on this 49MHz model, but certainly add to the vintage vibe. The phone features a page button, tone/pulse switch, charge indicator, AC adapter, and other modern-day features you shouldn't live without.

PolyFlame Concepts USA: 203.358.8100

compiled by David Pescovitz



Alien Seat

If you want to impress your friends (or throw a scare into 'em), the **ThunderSeat Predator** oughta do it. More fun than a regal throne, and scarier than a face hugger sucking on your tonsils, this high-tech chair spews excitement. Blueprints reportedly stolen from area 51 were used in the development of this cool-looking chair, which features an ergonomic body design, and thumping subwoofer and speaker system. Cranking up the volume is guaranteed to shake your brain. The Predator sells for $399.95. Better hurry. Aliens around the universe are lining up to try it out.

ThunderSeat: 800.884.8633

Print your prints

One of the problems with digital cameras is that you don't get any snapshots to fatten your analog photo album. Panasonic's **TruPhoto Digital Photo Printer** solves the problem. This device spits out 3.5x5-inch glossies for nearly the same price as traditional instant photos. Forget ribbons, inks, toner, and nasty photo chemicals—TruPhoto uses a new paper technology called Thermo-Autochrome. The $499.95 printer includes Panasonic's *PhotoSuite* software to edit photos and prepare them to be printed. Now you can show off your kids at the office without having to trick your co-workers into huddling around your monitor.

Panasonic Interactive Media: 888.726.2746; www.panasonic.com

Set to stun

Remember Laser Tag? Now you can enjoy all the thrills of laser-blasting your friends right at the office! **PowerPenz Laser Shots** are oversized ball point pens rigged with infrared transmitters and receivers. Aim at your co-worker's pen and... Fire! Flashing LEDs and cheesy sounds signal a direct hit. Comes complete with the four(!) button-cell batteries needed for each pen. There's even a silent mode, so your kid can zap his friends in study hall without fear of reprimand. The $29.99 two-pack of PowerPenz Laser Shots even comes with extra ink refills.

YES! Entertainment Corp.: 510.847.9444

All the channels, all the time

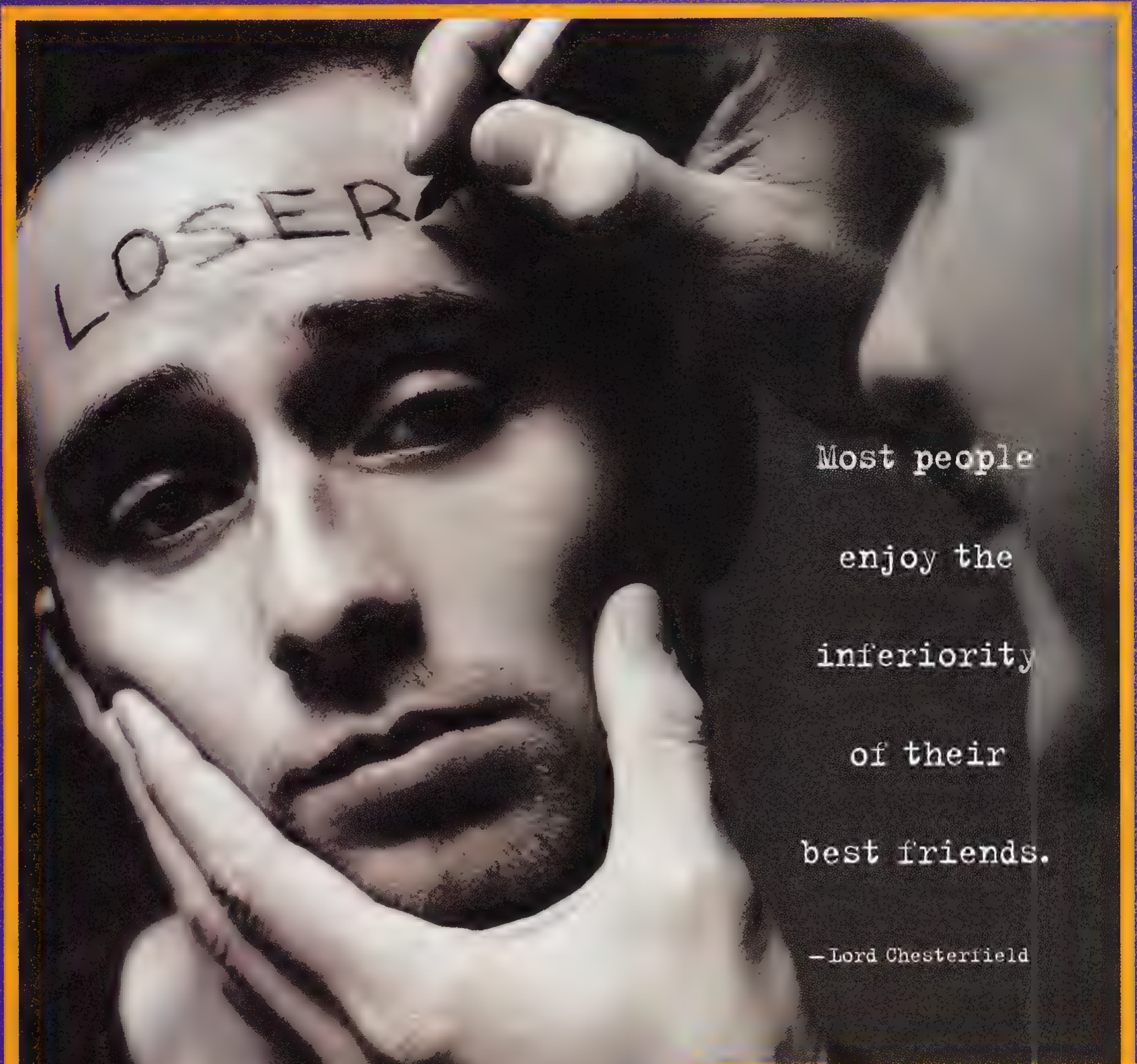
Pack the **Marco Polo Travel King** and you'll never be without your Direct TV digital satellite entertainment. The suitcase system includes a 14-inch satellite dish and a variety of mounting accessories. Use the suction-cup mount to make your cross-country RV trip more interesting, or set the dish on a hotel table so you don't miss any of your home team's games while you're on the road. The $999.95 system operates on either 110V or 12V AC/DC and can be installed in less than 15 minutes. The perfect gift for the unusually mobile couch potato.

Bismarck Lab: 619.320.3108

Note to myself

Typing a reminder into a PDA while driving, can be a pain—quite literally if you rear-end somebody in the process. The **Voice It Manager** offers PDA-style features, but instead of typing, you just talk. Verbal notes can be categorized into five files, and an alarm feature will play specific messages automatically at designated times. The Contact file holds up to 100 names, each with up to three phone numbers, which can automatically dial when held up to a telephone handset. Both units are palm-sized, with the VM-15 model featuring 22 minutes of recording time for $129.95; the $169.96 VM-30 offers 45 minutes.

Voice It Worldwide: 800.478.6423; www.voiceit.com


LOSER
Most people enjoy the inferiority of their best friends.
—Lord Chesterfield

SideWinder
game pad

Compete head-to-head. Surrender nothing.

The Microsoft® SideWinder™ game pad makes it a fair fight for you and up to three of your best friends. Hook up to any of your Windows® 95-based games and all four (or three, or two) of you get the same fully functional, lightning-fast game control and multibutton maneuvers. So no matter how many are plugged in, the competition's still quick and exciting. It's a perfect fit for hands of all sizes, letting you keep a solid grip and making it easier to use any of the buttons or triggers to vanquish your opponents. Record complicated, hard-to-remember multibutton moves and map them to a single button for swift execution of lethal maneuvers. Remember, the more SideWinder game pads you own, the more friends you can take advantage of. A little friendly competition never hurt anyone, right?

Microsoft

Where do you want to go today?® www.microsoft.com/sidewinder/

©1996 Microsoft Corporation. All rights reserved. Microsoft, Where do you want to go today? and Windows are registered trademarks and SideWinder is a trademark of Microsoft Corporation.

THE NEURAL NET THAT WASN'T

THE QUEST FOR ARTIFICIAL INTELLIGENCE IN BATTLECRUISER 3000 AD

Battlecruiser 3000 AD went straight from long, troubled development to being the most unplayable title ever released. The developer, Derek Smart, thought he could take gaming to the next level on his own. The publisher, Take 2, thought they could tame a renegade developer who had defeated a string of more experienced companies.

Last month, I promised interviews with Take 2 and Derek Smart. In the meantime, a controversial article appeared in another magazine detailing some of Dr. Smart's antics (including the alleged destruction of a Coke machine at Take 2's office), and all interviews were canceled. Before that, Take 2 and Smart were just settling down to fix the game. Since then, Smart claimed the article was all lies and that he was suing Take 2 for reasons that remain unclear.

As we go to press, Smart claims the rights to *BC3K* have reverted to him and he will cooperate with Take 2 to create a working "Developer's Edition" complete with a usable manual. But perhaps it's all a moot point, since *BC3K* is being returned in droves. Many stores, in an informal poll, reported 100 percent return rates.

But who is at fault? Both Take 2 and Smart have been flamed violently online, but the final arbiter of quality is obviously the publisher. "What did they know?" and "When did they know it?" is the classic measure of culpability. Did they release *BC3K* knowing it was unplayable? Or did they fail to see its flaws due to inadequate testing? The former makes them greedy, while the latter shows them as incompetents, and neither portrayal is particularly flattering.

> "The concept of training [neural nets] to do the complex tasks required in a game is inconceivable. It's mumbo jumbo. I guarantee you that if there is a functioning neural net that does *anything* in [*BC3K*] this man would be in the Computer Science Hall of Fame." – *Keith Zabalaoui*

At the core of all of *BC3K*'s failures is the most contentious aspect of the game: its alleged "neural net AI." Both Smart and Take 2 say this is a new step in artificial intelligence: a smart game that learns as you play it. Nothing could be further from the truth.

A neural net can be defined as: "a computer system made up of a number of simple, highly interconnected processing elements, which processes information by its dynamic state response to external inputs."

Behind this theory is the idea of backpropagation, which is used for prediction and pattern matching. Neural nets are mostly used for mundane mathematical purposes, but can also determine future real estate values or stock performances.

The net learns by example, so it must be trained on real input. As the net learns the relationships between the cause and effect of the input data, it begins to form predictions. This takes a very long time, since the net must be exposed to all the data repeatedly before it begins to "see" the patterns.

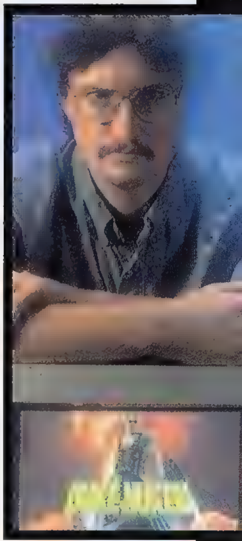
Neural nets can be used for things such as character recognition software and sonar signatures. Over time, a well-programmed net can be "taught" to recognize the way you write an "A" for example, or to recognize a ship from its sonar signature. This is only the most basic explanation of an excruciatingly complex set of theories and formula, but it should be enough to get an idea of what a true neural net can do.

I asked two former NASA programmers, now involved in computer games, how neural nets might be used in a game: Keith Zabalaoui, President of Atomic Games, and Gary Riley, strategic AI programmer for Atomic's *Close Combat*. Riley said, "I don't really see how you'd apply something like that to a game. I have a hard time believing it's in there. We used to have to train these things for hours and hours to teach it even the simplest tasks."

Zabalaoui adds, "So the concept of training [neural nets] to do the complex tasks required in a game is inconceivable. It's mumbo jumbo. I guarantee you that if there is a functioning neural net that does *anything* in [*BC3K*] this man would be in the Computer Science Hall of Fame."

Another complication with training a neural net for games, according to Riley, is that, "you don't really know what the internal representation [of the data] is, so for a game it would be very difficult to get that to be useful. With character recognition, it *may* recognize a new character, but not always. So, if you were having it make decisions in a game, there would be no way to prevent it from making illegal decisions."

The term "neural net" just makes *BC3K*'s AI sound like its more than it really is: a complex set of algorithms, potentially with more depth than some games, but certainly not a truly thinking, learning artificial intelligence. *BC3K* may deal with different symbols and metaphors than, for example, a chess computer such as "Fritz" (available as *Extreme Chess*), but at their heart these are simple causes and effects that trigger certain actions and reactions. It may appear to "think," but it only does what the programmer has already told it to do in a given situation.



T. LIAM MCDONALD is the all-knowing god of gaming. He also writes about computers, literature, and horror for numerous mags.

So, inflated claims and outright falsehoods can be added to the long list of *BC3K* sins. Games that are bad are usually consigned to oblivion by the marketplace, but in the case of *BC3K*, maybe it's the creators who should be consigned to oblivion. Or at least an endless session of their own game.

That is, if it actually ran. b

See it on bootNet

Go to the bootNet for more info about *Battlecruiser 3000 AD* and a set of FAQs from the Internet.

Absolute
POWER
DESCENT II
TOMB RAIDER
EIDOS Interactive
FORMULA 1
Scorched Planet
pod
MECHWARRIOR 2
NO Consequences

Now you can experience the absolute power of 3Dfx Interactive's Voodoo Graphics.™ Blazing speed, life-like images, and killer special effects the other guys just can't handle. Fire up every bleeding-edge 3D feature with no performance consequences whatsoever. You get the gaming experience of a lifetime when you buy products bearing the 3Dfx Interactive Powerfield! And it's the same Voodoo Graphics technology that you use when you play the latest and greatest arcade games!

Own an arcade of your very own. Look for the Powerfield on today's hottest game titles, and the coolest multimedia kit packages and systems, and arcade cabinets — it's your guarantee that you've found the most mind-blowing 3D game experience on the planet!

These 3Dfx Interactive Partners
make hot games happen!

The coolest products:

The hottest titles:

3Dfx Interactive, Inc. • 4435 Fortran Drive, San Jose, CA 95134 • Phone: 408 935-4400 • E-mail: info@3dfx.com • Web: www.3dfx.com

Call our partners for information or call 3Dfx Interactive (888) FOR-3Dfx

Copyright © 1996 3Dfx Interactive, Inc. The 3Dfx Interactive logo and Voodoo Graphics are trademarks of 3Dfx Interactive, Inc. All other trademarks are the property of their respective owners. Logos used by permission.
Voodoo Graphics™ on a PC supports MS-DOS,® Windows® 95, and is the ultimate Microsoft® Direct3D™ game accelerator. Bar None.

Product Information Number 371

A SHOCKING FAILURE

SHOCKWAVE SOUGHT TO BRING STALE INTERACTIVITY TO THE WEB

So... whatever happened to Shockwave? Where is that whiz-bang, full-color blast of multimedia yada yada that promised to travel cross-platform with the Internet?

After all, it *was* destined for silicon glory, wasn't it? And not just 'cuz it was so damn cool, but because Macromedia's monolithic installed base of developers was behind it, and its player was embedded in both *Navigator* and *Internet Explorer*. With all of this pushing the little giant along, it seems almost laughable that the technology never quite materialized as anything more than a cartoon gadget for Hollywood web heads.

Most everyone who's using Shockwave does so for entertainment purposes—games, music, and super-fly film promotions. This is *not* to say that there hasn't been some interesting Shocked content out there. If anyone remembers the Deep Forest site (Deep Forest being a quasi tribal-beat dance band of club fame), they should remember that it was awesome. Clicking different drums generated different beats and background melodies. You could mix and match, rock and roll, and all with super animation and groovy design. The mixing turntables were nice too. Learn to be a DJ in 60 seconds. Music to my ears.

And before *Navigator* and *Internet Explorer* supported embedded audio and background sound tags, Shockwave was the only really viable solution for adding reasonable quality audio to a web page.

> With all of this pushing the little giant along, it seems almost laughable that the technology never quite materialized as anything more than a cartoon gadget for Hollywood web heads.

Nostalgia aside, I just did an Alta Vista search for "Shockwave" and not one site out of the first 100 I surveyed was more recent than June '96 (right around Java's second wind... hmmm). I checked Yahoo, and the results were even more dismal—merely a list of people with Shockwave on their résumés (as a marketable skill?).

The poor bugger, it's dust in the wind.

Ironically (or not), Macromedia's site was hip to the web shtick, updated regularly with an extensive and colorful gallery of Shockwave sites ranging from games to maps to education. It had the distinct aura of credibility, like a real product might have, and it successfully pitched the image that Shockwave is viable. Cool, even. In fact, if you got all your info about Shockwave from Macromedia, you'd think it was the next best thing since cable modems (after all, that's what you'll need to download these behemoth files).

So, does the web still believe in Shockwave?

According to the Macromedia web site celebrating Shockwave's first birthday on December 6, 1996, "With over 15 million downloads, Shockwave *is* multimedia on the web." Long live the hunt-and-click CD-ROM... only this time, the content is online.

Wait.

Didn't the hunt-and-click CD-ROM go belly up not too long ago? Didn't all those hip developers abandon CD-ROMs for faster, flashier Internet start-ups and board seats on *Wired* magazine? And wasn't that exodus on account of the fact that *Myst* clones suck? Because they're about as interactive as turning on or off the hallway light switch a few hundred times? Because they're 25 percent content (half of which is circa-1990 static renders and half of which is mindless pattern-based puzzles); 25 percent promotion (all of which is hollow promises); and 50 percent digital fluff (packed in to fill up a CD's massive capacity?).

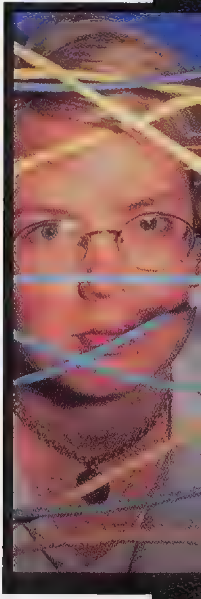
It's hard to grasp how porting that stale "interactivity" from the disc to the web could be good. It could only be some mass consensual hallucination and the illuminati's innate inability to let a sleeping dog lie.

The fault with Shockwave does not lie with the developers. It's not that they're bad artists, or crappy writers, or that there's some general drought of talent or creativity. And it's not that the development tools are inadequate. Macromedia has done a fine job creating an entire industry around its software. The problem is simply that the medium itself is boring. Director-based hunt-and-click content searches are boring, boring, boring.

The world has turned and the paradigm has shifted (as it does every 45 seconds in emerging technologies). Those who resist the momentum of this tide may as well pack a glass bottle, 'cuz they're drifting out to lone islands of techno-alienation.

The web is for interactivity, and true interactivity is not about hunt-and-click. It's about dynamic interactions in real time. It's about communication and random events. And although Shockwave has a strong user base that's passionate about animation, truth be known, other products do interactivity better, with less tow on the bandwidth.

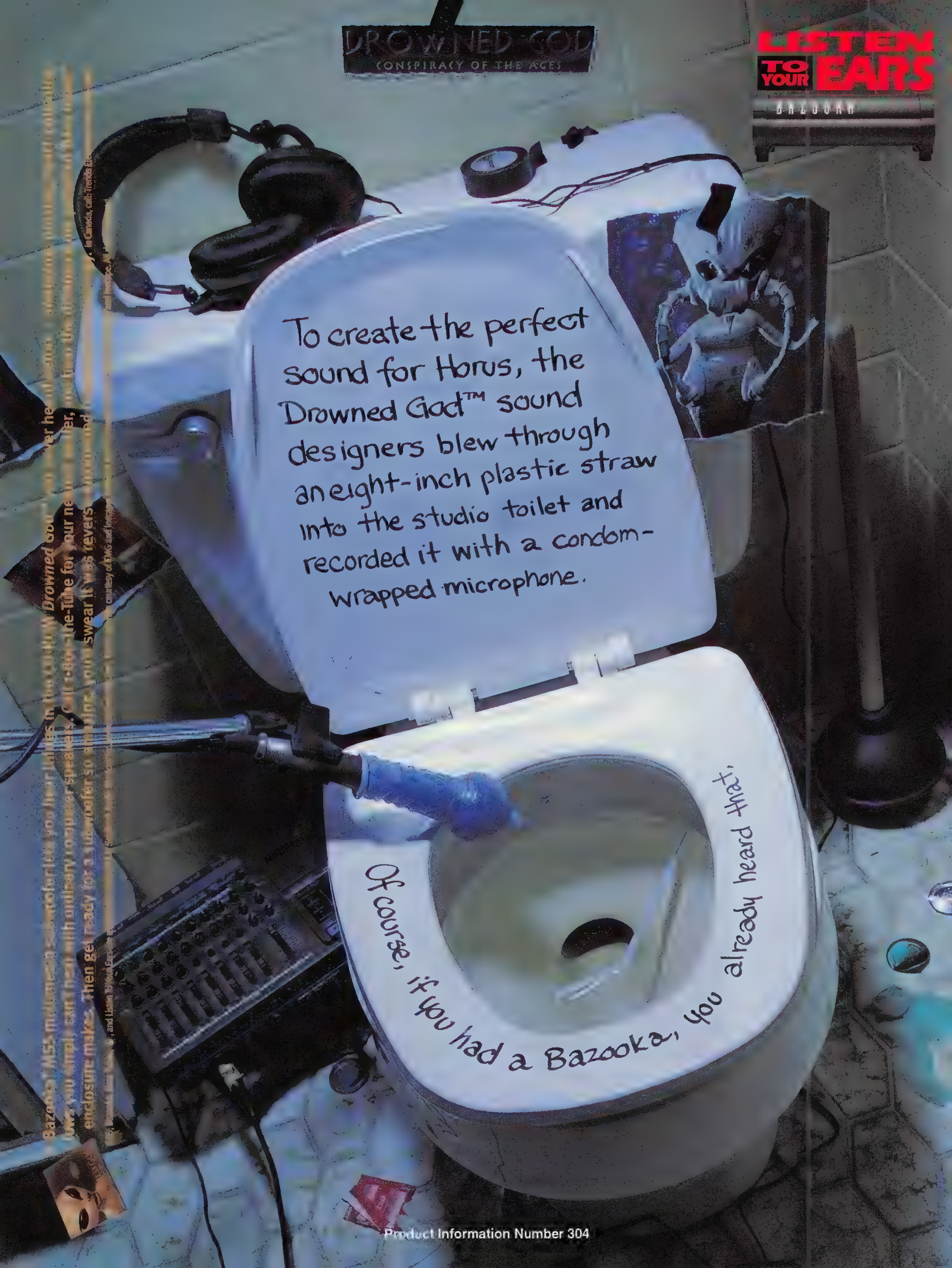
The problem with successful software companies that create vertical niche markets is that eventually that market evolves. And when it does, no matter how big the company has grown, tying the hands of creativity to an application created years ago just won't fly. Even if the application was *really* good. Macromedia has two choices: continue to go vertical but redesign the flight plan, tossing old technologies overboard in lieu of new ones; or be grounded, right alongside the Sony Betamax.



SHEL KIMEN (kimen@well.com) has spent more time online than is reasonably healthy for one person and dreams in hypertext.

See it on bootNet

Check out Shel's column on the *bootNet* site for examples of bad Shockwave.


DROWNED GOD
CONSPIRACY OF THE AGES
LISTEN TO YOUR EARS
BAZOOKA
To create the perfect sound for Horus, the Drowned God™ sound designers blew through an eight-inch plastic straw into the studio toilet and recorded it with a condom-wrapped microphone.
Of course, if you had a Bazooka, you already heard that.

Bazooka® MSS multimedia subwoofer lets you hear things in the CD-ROM *Drowned God*™ you never heard before [illegible]
lows you simply can't hear with ordinary computer speakers. Call 1-800-The-Tube for your nearest dealer, [illegible]
enclosure makes. Then get ready for a subwoofer so amazing, you'll swear it was revers[illegible] In Canada, call: Trends Ele[illegible]
[illegible], and Listen To Your Ears [illegible] courtesy of EMG and Inscape [illegible]

Product Information Number 304

INTEL'S NEW MOTHER-DAUGHTER RELATIONSHIP

CLOSING THE DOOR ON AN OPEN ARCHITECTURE STANDARD

Intel's new chip-packaging technology could fundamentally alter the balance of power in the PC clone industry.

Intel calls it a single-edge contact (SEC) cartridge, but it's more generically known as a daughtercard and slot, which will replace the CPU sockets now found on all PC motherboards, and Intel will use it for all future x86 processors, starting with Klamath.

Although Intel has some very good technical reasons for adopting this technology, you can't help wondering if it doesn't have some devious business reasons, too. The catch is that the new daughtercard isn't an open standard. Intel's competitors (mainly Advanced Micro Devices and Cyrix) will have trouble making compatible daughtercards that don't step on Intel's patents—or on the toes of Intel's infamously hyperactive lawyers. In other words, Intel is introducing a proprietary standard into a PC clone industry that thrives on open standards.

> Just because I fervently believe black helicopters from the United Nations are responsible for cattle mutilations in Montana doesn't mean I think Intel is out to destroy the clone industry.

Now, don't mistake me for another *fin de siecle* conspiracy nut. Just because I fervently believe black helicopters from the United Nations are responsible for cattle mutilations in Montana doesn't mean I think Intel is out to destroy the clone industry. Frankly, Intel makes a good technical case for the SEC cartridge.

Intel is trying to find a way to deliver higher-speed processors at the lowest possible manufacturing cost, while still allowing users to upgrade without changing motherboards. Those multiple goals require a new approach to system architectures, and CPU daughtercards are a logical option. Indeed, Apple and some Macintosh clone makers have been using CPU daughtercards for a couple of years now. Some will be able to upgrade with the new 533MHz bipolar processors. (See last issue's "Fast Forward.")

The technical justifications start with the problems of chip packaging. In industry parlance, the "package" is the supporting structure that adapts a chip to a socket. The little black thing with pins sticking out that we commonly refer to as a "chip" is actually the package. The real chip is a small piece of silicon embedded inside the little black thing. The package is usually made of plastic or ceramic, and it serves three main purposes: It protects the chip from physical and electrical harm; it helps to dissipate heat; and it wires the chip to the external pins, which complete the electrical connection between the chip and the socket.

Chip packaging has grown extremely complex over the years. The world's first microprocessor, Intel's 4004 in 1971, had only 16 pins, and they were spaced far enough apart that a mere mortal could solder them onto a circuitboard. Even more quaint, the 4004's package was made partly of wood. Today's Pentium Pro chips have 387 pins, and they're packed so tightly together that only a robot could solder them down. (Although I once saw an Intel engineer do some amazing things with a miniature soldering gun and a Leitz microscope.)

Unfortunately for Intel, the Pentium Pro's packaging technology is hitting a brick wall. The Pro depends on a tightly coupled outboard cache for its high performance. That 256K or 512K cache is a fast SRAM chip that's embedded in the same package as the CPU chip and is connected to the CPU by a special bus. The bus is 64 bits wide and runs at the CPU's core speed, which can be as fast as 200MHz. In contrast, a Pentium's bus tops out at 66MHz. The Klamath will probably debut at 233MHz, and by the end of 1997, Intel plans to introduce another Pro variant known as Deschutes, which will likely hit 300MHz.

The dual-chip package of today's Pros is simply too complicated to reach the lower prices and higher volumes that Intel needs for the Klamath and Deschutes. One alternative is to remove the SRAM cache from the package and connect it externally, but that would boost the pin count to 528 and inflate manufacturing costs still further. Another alternative is to eliminate the cache bus, but that would seriously impair performance. A third option is to design the motherboard to run at the CPU's core speed, but that's technically impractical.

TOM HALFHILL is a senior editor at *Byte* magazine and the author of two computing books. He first became interested in computers during the disco era.

It's no surprise that Intel arrived at the same conclusion Apple did: Segregate the CPU on a daughtercard. This allows the CPU and the cache to communicate over a superfast bus that's isolated from the slower system bus on the motherboard. The result is no-compromise performance at affordable prices, and users can easily upgrade CPUs by swapping daughtercards.

The drawback is that Intel's daughtercard design is highly proprietary, so AMD and Cyrix will have great trouble cloning it. For years, AMD and Cyrix have competed with Intel by making x86-compatible chips that fit into standard sockets. That's about to end. AMD and Cyrix claim they can continue to make competitive chips that work in standard sockets for at least two or three more years, and by then they'll have another solution. We'll see. But in the meantime, PC manufacturers and users who adopt the new design will have only one source for CPUs: Intel.

It's not that Intel is a poor choice; Intel's CPUs historically lead the pack in x86 performance. It's just that the PC clone industry needs open standards to prosper, and one of those standards is about to disappear. b

"We had a vision, about four or five years ago, that these so-called 'business' graphics accelerators could be used for games. Everyone kind of laughed at the idea…"

During the past 10 years, ATI has emerged as a leader in **PC video technology**. The feisty Canadian company has made inroads into the lucrative American market and Pacific Rim markets, and is now recognized as an international **force** to be reckoned with. In 1996, ATI began battling their principal competitor, S3, for domination of the **OEM** market and struck a mighty blow, landing the **Sony PC** account. Leading ATI in this battle is vice president **Henry Quan**, a technology visionary with the business acumen to transform ideas into reality.

PHOTOGRAPHY BY MARK MADEO

Who's Laughing Now?

ATI's vice president, **Henry Quan**, that's who.

boot: What do you do at ATI?
QUAN: Everything but sweep the floor. I run both the strategic business as well as the product planning side of it. The strategic side involves working with the key influence section—be it Microsoft, Intel, or others—plus strategic OEMs and developers. We typically work two years in advance to shape the future of the PC business. So it's basically understanding what technologies are in place, developing, and rationalizing the outcome of this technology.

boot: Why is gaming important to ATI?
QUAN: Because we think it's the No.1 application for computing. Certainly, if you look at impact, the real value to the marketplace is with gaming applications. It's why we sell multiple PCs into the home. The business environment is fairly price-sensitive. It is fairly constant, as far as rate of change. Gamers want more horsepower from the graphics subsystem and they want more horsepower from the processor. So we like that marketplace from the dynamic that it stresses our systems—it creates change in the marketplace. And it requires differentiation in the system, so it's not a generic configuration.

boot: What sets your chip technology apart from the others, such as S3's ViRGE chip for example?
QUAN: We typically put a lot of thought into our products and design in features we consider high-risk. We produce boards *and* chips, at the same time. The difficulty in being purely a chip company is the fact that you have to rely on your OEM customers to identify wear and tear. And being a board company is tough as well, because if you don't have chip technology, you can't differentiate the product. We have the ability to design our own technology *and* bring it to the marketplace—and that's very unique.

boot: How many chips have you sold to date?
QUAN: Last year we sold roughly 9 million chips. Our success has been predicated on the entertainment value of our products, so we've targeted a very advanced functionality

"Gamers want more horsepower from the graphics subsystem. So we like that marketplace from the dynamic that it stresses our systems..."

such as 3D graphics and full-motion video on our platforms.

boot: Tell us about your involvement with DirectX and Direct 3D?

QUAN: We had a vision, about four or five years ago, that these so-called "business" graphics accelerators could be used for games. Everyone kind of laughed at the idea of using a piece of hardware to accelerate games. So, since we had the basic technology on our chips, we designed a prototype application and showed that to Microsoft. That's how we started working with Microsoft. We traded a lot of code and ideas. From a technical standpoint, the relationship went very well. It developed into a marketing relationship whereby we did evangelism with Microsoft and we worked with them on their games SDK.

boot: How do you feel about Microsoft and Intel getting into the 3D market?

QUAN: It's good. It shows that 3D is a serious technology and we have the leaders rationalizing it. The fact that both Intel and Microsoft are looking at 3D hardware poses some extreme challenges, and it will help accelerate the rate of change in the marketplace.

Remember, we tend to isolate things to a specific technology. We say this is 2D or this is 3D or this is video. Really, the end customer doesn't care. They're looking for the best visual experience—and we're trying to provide the best combination of visual experiences at the right time, at the right price, at the right place.

boot: How many developers are writing for your technology?

QUAN: That's a difficult question to answer. From the standpoint that we are an Intel-based platform, any developer writing for DirectX will support our platform. Basically what we provide is baseline capability. It's how the developers use our technology that is important.

boot: When you evangelize, how many developers do you say are specifically on your side, as opposed to everybody else? Do you have any?

QUAN: A lot of developers support our technology. For instance, Activision did a special port of *MechWarrior*. Companies such as Sony do special ports for our product. The reason people support an ATI product over another is that we have a huge installed base. We are one of the top 3D vendors in the marketplace. ATI and S3 will account for 70 percent of the 3D platform this year.

boot: So, do you see S3 as your biggest competitor?

QUAN: S3 *is* our biggest competitor.

boot: What did you announce at Comdex this year?

QUAN: The 3D Rage LT: a 3D notebook chip that offers exactly the same horsepower and features you are getting on your desktop. We expect to ship that in volume this January.

In 1997, we'll announce our 3D Rage III chip. This will provide a million polygons per second, textural performance of 45 million pixels per second, a hardware setup engine, and support for AGP. The accelerated graphics port will allow you to pool huge amounts of texture memory, beyond 16MB. That means very high-quality games. And certainly those are feature sets very few 3D vendors can claim.

boot: What else is planned?

QUAN: Basically, our vision is that the computer is really three chips: there's a memory chip, there's a processor, and then there's an ATI chip.

boot: What other innovative technology will we see from ATI during 1997?

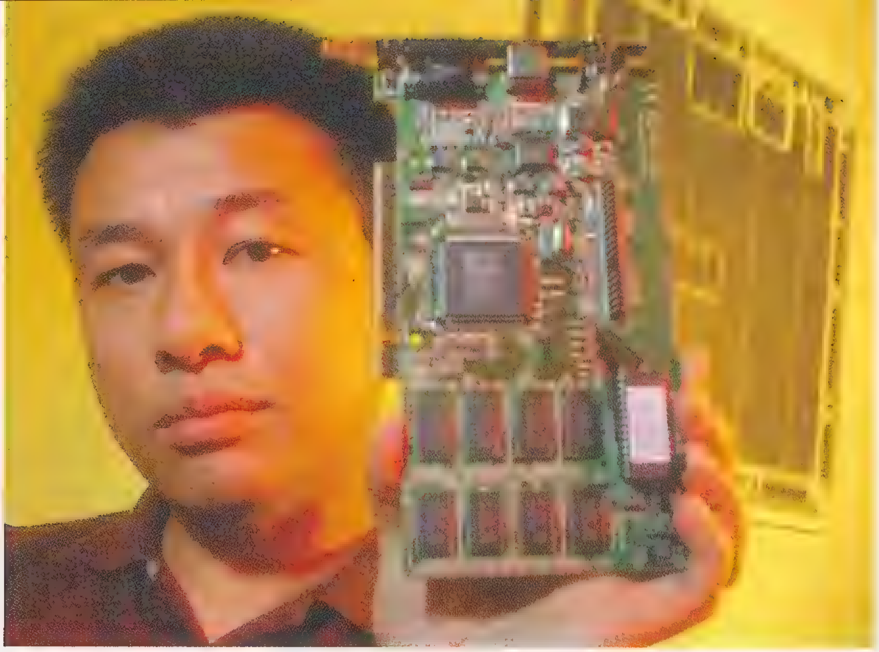
QUAN: Today we're talking about computer-quality motion video; with the advent of DVD, we are talking professional-quality video.

Our 3D performance will step up to arcade-level; basically, by way of a consolidation of the technology. Separate chips will collapse into a single chip. The benefit to the consumer is lower prices. And from the standpoint of actual application, the chip is more versatile for accommodating the various media needs.

We'll also see the advent of further consumer technology, such as television marrying computer technology. We're actually using the computer's intelligence to add value to the way you watch television. For instance, the human mind has a very limited attention span and we typically miss a lot of things going on in television. Using your computer to manage your TV, you'll actually be able to look at the information you missed and selectively key on information. So, if you're busy and you want to watch for all occurrences of Jerry Seinfeld or Roseanne, the computer will prompt you as to when that information occurred.

boot: So, the computer will go out to the living room?

QUAN: Definitely. That's why we've worked so much on our television technology. That's why we've put TVO standard equipment on the graphics boards; that's why



> **"[3D Rage III] will provide a million polygons per second, textural performance of 45 million pixels per second, a hardware set-up engine, and support for AGB."**

we've done so much work in consumer-motion video. We want to have three or four PCs in the home. And the only way you can do that is to get out of the office and into the family room. You have to provide the entertainment that will keep someone focused on the computer.

boot: What impact will DVD have on ATI?

QUAN: We've worked very closely with Intel and Microsoft to support DVD with our products. The 3D Rage II Plus, which we announced shortly after Comdex, includes DVD acceleration. So we have motion compensation built right into the hardware and that will double the frame rate in DVD without specialized hardware, which runs at $200 or $300 extra at this point.

boot: Do you see the PC replacing console games in the future?

QUAN: One would hope that would happen, but I think consumers look for something different. Typically, computer games have more depth than arcade games. So the real benefit of the computer game is its richness. The simplicity of an arcade game is still there: very fast action, low maintenance, easy to use. In the home you still have people who aren't computer literate and they just want to plug the cartridge in. They don't want to maintain the complexity of the computer.

> "The fact that both **Intel** and **Microsoft** are looking at **3D** hardware poses some **extreme** challenges, and it will help **accelerate** the rate of change in the **marketplace**."

boot: What changes will we see in 3D this year?

QUAN: The big changes are from a quality perspective: PCs are going to be arcade quality; and from a technology perspective: expect 3D hardware set-up engines that will take you from today's 20,000 polygons per second, all the way up to 1 million polygons per second. Today's 15 frames per second will jump up to around 45 to 60 frames per second. You're going to go from resolutions of 320 to 240, up to 800x600, running at those frame rates. And you're looking at very high-quality pixels with bilinear filtering and special 3D effects turned on. From a memory subsystem perspective, today we're looking at 2MB of memory; hardware will jump to 4MB being commonplace. Most of our graphics cards for 1997 will expand to 4MB and with things like AGB, you're going to get access to a huge amount of memory for free. You will use your system memory for 3D acceleration. That will mean that very sophisticated games, such as flight simulators with 8MB of texture terrain can be accelerated under these new platforms. The programming model for accelerators and non-accelerators will be more common and you will get the best of both worlds with AGP and hardware acceleration.

boot: When will we see motherboard implementation? Six months? A year?

QUAN: When a market is mature, chips go on the motherboard; when the market is changing, chips go back to boards. When VGA products were stable, they went to the motherboard. When graphics accelerators started coming out, they all went to boards. And as it matured, it went back to the motherboard. So now we're in an interesting phase where we have technology such as AGP coming out. With AGP, everything will move back to the board.

boot: Microsoft's Game Evangelist, Alex St. John, raves about Rendition's Vérité chips. Why is that? Why is Microsoft on Rendition's bandwagon and not ATI's?

QUAN: Different people meet different needs in the marketplace. Microsoft has a good working relationship with Rendition based on Renderware. What's good about ATI is that we don't stand still. Already we have several generations of 3D products in the pipeline. We're building for the future.

boot: How much for a Rage board?

QUAN: We have multiple flavors. We have a board called the 3D XPression, which uses our 3D Rage II chip. With 4MB of memory, it will be about $250.

boot: The 4MB Rendition board sells for $150. Why should someone pay $100 more for Rage?

QUAN: It's our ability to perform all of the operations. The Rage board does very good 2D acceleration; it does very high-quality motion video, and it does very good 3D. It also provides TV-out. It's that combination that gives you all-around, general purpose use. Don't forget: The computer is a general purpose medium—it's not just designed to play 3D games.

boot: ATI and Matrox have a little war going on at their web sites about false advertising claims. You both have a position on each other's products. What's up with that?

QUAN: Everything on our web site is correct. The fact of the matter is that the ATI product has more features in hardware than the Matrox product. And the optimizations are all Microsoft-approved, whereas some optimizations from other vendors are not Microsoft-approved.

boot: Do you feel that ATI's 3D horsepower is equal to that of 3Dfx?

QUAN: At this point, it's not. But if you tune in next year, at the Computer Games Developer's Conference, we can probably talk about exceeding most of the hardware in the marketplace today.

FIRING THE ONLINE AFTERBURNER

A step-by-step guide to adding multimedia to your site

Web pages don't need to be static compendiums of **icons** and **text**. Dynamic **presentations**, complete with **sound** and **motion**, can be imported from the industry standard application for creating **multimedia**, Macromedia *Director,* straight to your site as a **Shockwave** applet.

The only limitations are **bandwidth** and your **imagination**.

BY DAVID W. BOLES

idea

Before even opening *Director*, you'll need to come up with the idea that you want to convey. I needed to create a logo for my web site at **boles.com** and decided that, for maximum impact, it should be a Shockwave movie.

Now just what is it I need in a logo?

Well, it must be **brief**. The logo shouldn't steal the show at the site—there are more important things for visitors (and their browsers) to chew on.

To accomplish this, be aware of the **size** of the file. Nobody wants to be forced to sit around while 200K of Technicolor travesty downloads. The movie should be sharp, short, and to the point. At 40K, even a 14.4bps surfer will only have to wait 30 seconds for the logo to load and fire. To hit that magic file size, make the image files small; greyscale will suffice—full color is too much size for too little grainy gain.

The next step to keeping it brief is: **No looping!** Don't bombard visitors with an endless movie that repeats and repeats. Say what you have to say once and be done with it. If visitors want to repeat the movie, they can hit the Reload button for a replay. Some may think the movie is too short. Believe me, it's better to be quick and keen than slow and dull.

I want the movie to have **music** (after all, this *is* multimedia). I'll use a short drum riff and cut the movie to match the beat. This will help distinguish my site on the web, because many web masters only use sound as an afterthought or as MIDI background music.

The reason for Shocking the logo is to ensure that it's **dynamic**. The animated effect will make the eye jump along with the beat of the drum riff, creating a full-scale multimedia experience in less than two seconds. The spiritual cadence of the movie will be parallel time in three tiers: Image, Movement, and Sound.

And, most importantly, the logo must be **representative**. It should express the intent of the site. boles.com is where my wife Janna, who is deaf, and I call home, so I'll use sign language to finger spell "b-o-l-e-s-dot-com" in my movie. That will set the stage for a multimedia palace where deafness and design coexist.

If you go online, you can visit the movie right now. Just go to boles.com and you'll see all 39K of this Shockwave movie. After you've watched the movie, hit Reload to see it again, or click on Continue to view the source images used to animate it. The entire self-playing 1.6MB version of the movie is contained on the *bootDisc* bundled with this magazine, along with the *Director* source file. If you don't have Shockwave on your system, you can find the Shockwave plug-in on the *bootDisc* as well.

Web Warnings

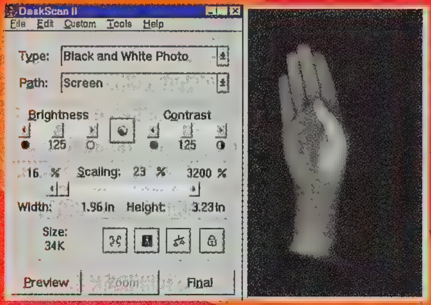
Points to ponder before posting

While an endless realm of possibilities exists when it comes to creating *Director* projects, keep in mind the following general rules for creating your own Shockwave movies for the web:

- Avoid including more than one movie per page. Multiple movies consume RAM and can freeze a visitor's system. If you're set on using more than one movie, or if you want to call a movie from within a movie, try to stick to a maximum of three movies total on any one page.
- Use sound in only one movie per page because web browsers get confused when they have to stream more than one soundtrack simultaneously.
- Indefinitely looped movies hog CPU cycles and bloat a browser's ability to access the network, so if you insist on loops, limit them or give the user a visible button to stop the movie.
- Limit the color palette to save space and download time.

shop

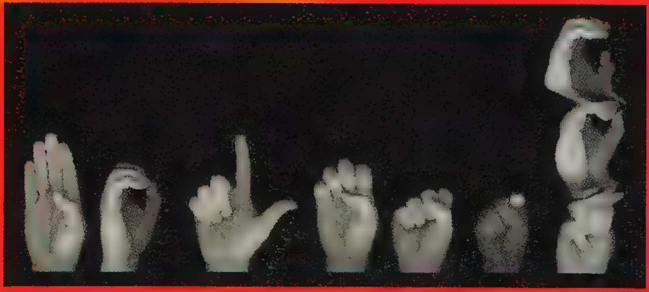
First, I've decided that each letter in "boles" should be an individual hand-sign graphic. So, scanning directly into *Photoshop* from a TWAIN-compliant Hewlett-Packard 4C flatbed scanner, I grab a black-and-white photo of my hand seven times for each letter of my last name (plus a "dot" and one "com") saving each as a BMP file, which *Director* easily imports.



Type: Black and White Photo
Path: Screen
Brightness: 125
Contrast: 125
16 % Scaling: 23 % 3200 %
Width: 1.96 in Height: 3.23 in
Size: 34K

This is the first hand scan, using Hewlett-Packard's 4C *DeskScanII* software inside *Photoshop 4.0*.

To break the eye-boredom of so many singular hand signs, I decide to get funky, and create a single scanned image that represents all three letters in "com." By moving my hand on the scanner, each handcrafted letter blends into the next one. I hold each letter for the moment the scanner light bar passes over my hand and then I quickly move my hand down the scanner bed to form the next letter. In the space of a single pass, I move my hand to create the three finger-spelled letters of "com."



This is how the sequence of "b-o-l-e-s-dot-com" images will appear.

Now that all the art is created and saved in the appropriate format, it's time to build the sound file that will play with the logo.

Director Xtras

Build to suit

Director 5.0 supports an extension standard that allows multimedia producers to tailor the program to their needs. These extensions are known as "Extras," and a few of the most helpful are listed below.

Human Code's **XtraNet** allows Macromedia *Director* and Shockwave movies to communicate on the web. By using XtraNet, you could connect CD-ROMs to the World Wide Web for live updating of new content. XtraNet can also create multiuser game environments. You can find Human Code online at **www.humancode.com/xtranet.**

WebXtra is available from Tabuleiro da Baiana at **www.tbaiana.com**. This Xtra turns *Director* movies into a platform for viewing any file type registered to be handled by an ActiveX control. A single *Director*-powered experience can now include viewing Microsoft *Word* and *Excel* files; enriched web pages featuring VRML and Java applets; and PDF documents. Using WebXtra you can embed HTML pages directly within multimedia applications, allowing your visitors to surf the Internet from within a *Director* movie.

MediaLab's **PhotoCaster** is an Xtra that instantly creates cast members directly from *Photoshop 4.0* layers. With a single click, you can import your entire *Photoshop* file into *Director*, and each layer appears as an individual castmember, indexed, antialiased, properly registered, and ready for staging. **www.medialab.com.**

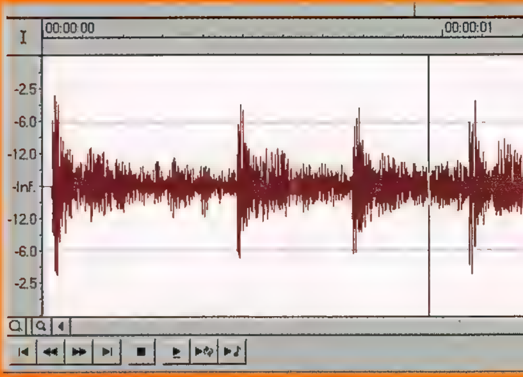
A complete list of Macromedia's Xtras for *Director 5.0* can be found at **www.macromedia.com/software/xtras/director/index.html.**

The **images** should **jump** and **blend** on an internal **beat**
discovered in the **creation**

forge

Sonic Foundry's *Sound Forge 4.0* is great for controlling and creating sound files. I have a drum beat WAV file I created some time ago that I'll use as the soundtrack in my movie. Each spike of the beating drum will be a signpost pinnacle for an animation transition. While the main beat points are at 0.029 seconds, 0.484 seconds, 0.772 seconds, 1.073 seconds, and 1.227 seconds, I won't bind my images directly to the point of those peaks. The images should jump and blend on an internal beat of their own, which can only be discovered in the creation of the actual animation in the *Director* movie.

Since I'm using greyscale images in the movie, I can afford sound files as deep and as rich as possible, so most of my project file size will be eaten up by a 170K 1.7-second drum riff!

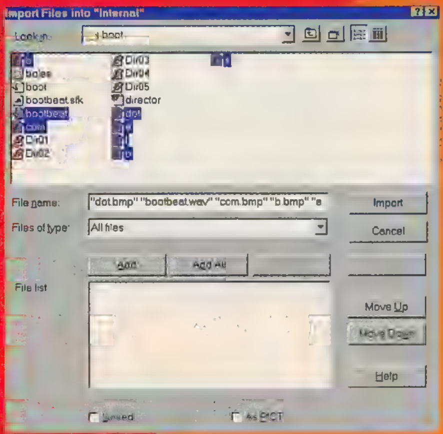


direct

Now it's (finally) time to launch *Director* and start building my logo.

1 Hit CTRL+N to start a new movie, once *Director* is loaded.

2 Choose Import from the File menu to bring in the sound and image cast members.


Import Files into "Internal"

Look in: boot

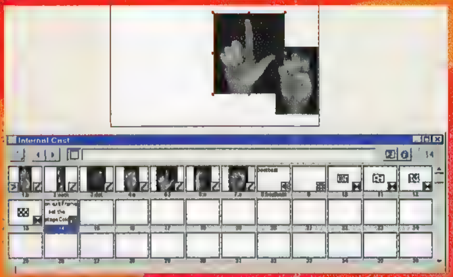
File name: "dot.bmp" "bootbeat.wav" "com.bmp" "b.bmp" "e

Files of type: All files

I select the files to import into my *Director 5.0* movie.

3 Choose 8-bit color depth in the Image Options import dialog box; Remap to Grayscale; dither; and check the Same Settings for Remaining Images box.

4 Click on OK to begin import. With the internal cast set, I'm ready to start dragging and dropping my images and sound onto my *Director* stage to arrange the flow of the movie.



I pick the images I need from the Internal Cast window and drag and drop them onto the "stage" area of my *Director* project. I can resize the images by dragging a border handle.

Each of the seven images should blend on stage and share end and beginning space in order to enhance the effect. I can't fade in and out, because there's no time to spare, since the movie's so short. The fact that most of the images will remain on stage for only three cells with the first and last cell shared with images before and after means that, in effect, "o-l-e-s" will appear on stage alone for only a single cell each!

The "b" and the "dot" will run for five cells, since the "b" is the first image to catch your eye and the "dot" is tethered to the syncopation of the drum beat before the final "com" image appears and then dissolves over a life span of 10 cells.

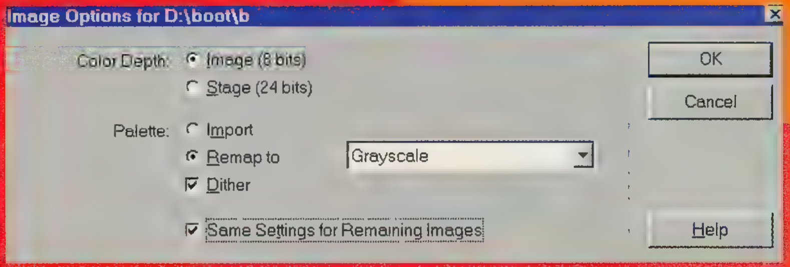


Image Options for D:\boot\b

Color Depth: ● Image (8 bits) ○ Stage (24 bits)

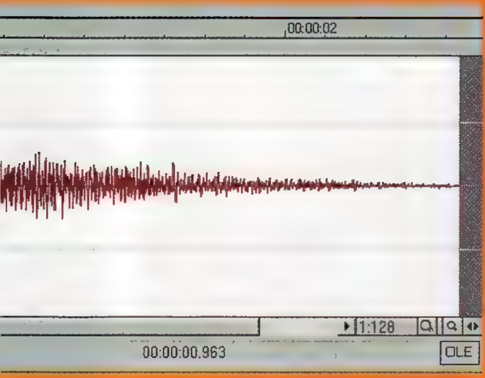
Palette: ○ Import ● Remap to Grayscale

☑ Dither

☑ Same Settings for Remaining Images

I choose the color depth and import qualities for my BMP files as I load them into a *Director 5.0* cast member window.

of their own, which can only be of the actual **animation** in the *Director* movie.

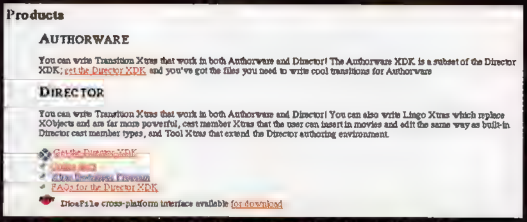

00:00:02
1:128
00:00:00.963
OLE

This is how *Sound Forge 4.0* views my WAV drum riff. The spikes are the hardest drum beats.

Write Your Own Xtras

Custum tailoring

The Director Xtras Development Kit (XDK) contains all of the files, documentation, and samples you need to get started developing Xtras.


Products

AUTHORWARE

You can write Transition Xtras that work in both Authorware and Director! The Authorware XDK is a subset of the Director XDK; get the Director XDK and you've got the files you need to write cool transitions for Authorware

DIRECTOR

You can write Transition Xtras that work in both Authorware and Director! You can also write Lingo Xtras which replace XObjects and are far more powerful, cast member Xtras that the user can insert in movies and edit the same way as built-in Director cast member types, and Tool Xtras that extend the Director authoring environment.

- Get the Director XDK
- FAQs for the Director XDK

DiosFile cross-platform interface available for download

www.macromedia.com/software/xtras/xdc.html#director

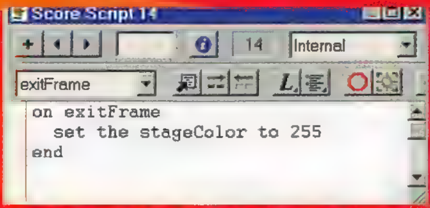
If the XDK isn't on your *Director 5.0* CD-ROM, you can download free from Macromedia. You'll need a programming background and experience with C or C++ programming languages in order to write *Director 5.0* Xtras.

One great thing about *Director* is that you have multiple channels for your images! Unlike regular film or video, where you have only an "A" roll and a "B" roll, *Director* allows you to get a better overall visual picture of precisely how your movie builds upon itself. My seven images create what looks like a staircase in the Score window. The movie channels appear to quickly "drop down a hill" as one image cascades into another.

One final tweak I add is moving the first and last cell of each image just slightly on the stage. This small change gives the image a feeling of animation, even though it's only taking place over a period of three cells. Viewers won't notice that each image moves—they'll only feel each image popping in and creating an arc across the stage as "b-o-l-e-s-dot-com" is spelled out. These invisible touches are what make a movie special. They are what create that "intangible difference," which a person experiences and expresses a liking for, but that they can't pin down exactly what it is.

5 Now I drag my bootbeat.wav file on the stage and it is automatically added to my Project window. Playing the movie, I discover that the general sound-peak points the images balance upon work well in fitting the throb of the entire drum riff.

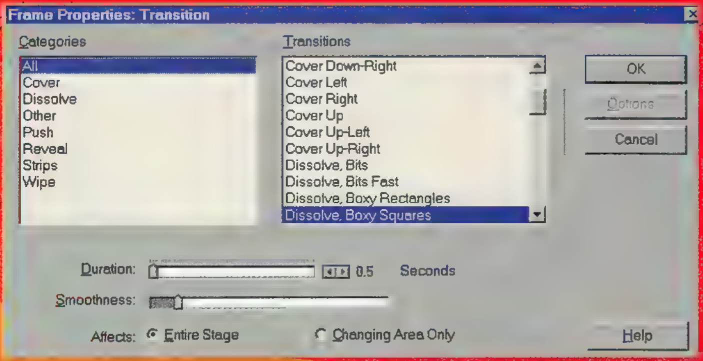
6 click the Script icon in the Score window to change the stage color with the Lingo command: Set the stageColor to 255. Now the stage is black instead of white.


Score Script 14
14
Internal
exitFrame

```
on exitFrame
  set the stageColor to 255
end
```

I want my movie to run on a black stage instead of the default white stage. I set that black background color via this simple Lingo script.

7 's time to end the movie. Right clicking on the Transitions channel in the Score window brings up this Properties box.


Frame Properties: Transition

Categories: All

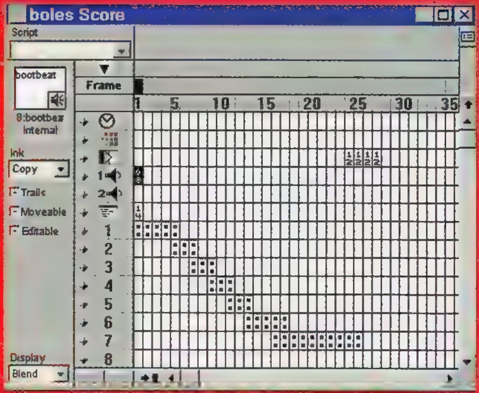
Transitions: Dissolve, Boxy Squares

Duration: 0.5 Seconds

Affects: ● Entire Stage ○ Changing Area Only

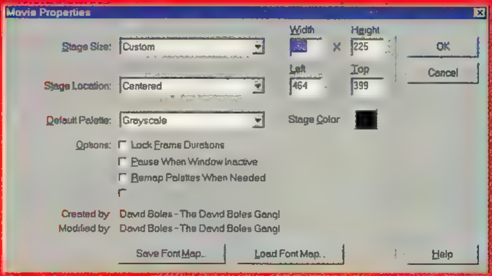
Cover
Dissolve
Other
Push
Reveal
Strips
Wipe
Cover Down-Right
Cover Left
Cover Right
Cover Up
Cover Up-Left
Cover Up-Right
Dissolve, Bits
Dissolve, Bits Fast
Dissolve, Boxy Rectangles
OK
Options
Cancel
Smoothness:
Help

This is the Transition screen. I pick a nice Boxy Dissolve for the end of my movie.


boles Score
Script
bootbeat
8:bootbea
Internal
Frame
Ink
Copy
Trails
Moveable
Editable
Display
Blend
1
5
10
15
20
25
30
35
1
2
3
4
5
6
7
8

Here's the score for my movie. Notice how the images form a descending staircase as they waterfall into each other.

8 y movie will end with a Dissolve into Boxy Squares. This transition works because the tiny dissolving boxes look and feel like miniature versions of the boxy finger spelling that has been popping across the screen during the movie, delivering a nice finishing touch.


Movie Properties

Stage Size: Custom

Height: 225

Stage Location: Centered

Left: 464

Top: 399

Default Palette: Grayscale

Options: ☐ Lock Frame Durations ☐ Pause When Window Inactive ☐ Remap Palettes When Needed ☐

Created by: David Boles - The David Boles Gang!

Modified by: David Boles - The David Boles Gang!

Width
Stage Color
OK
Cancel
Save Font Map...
Load Font Map...
Help

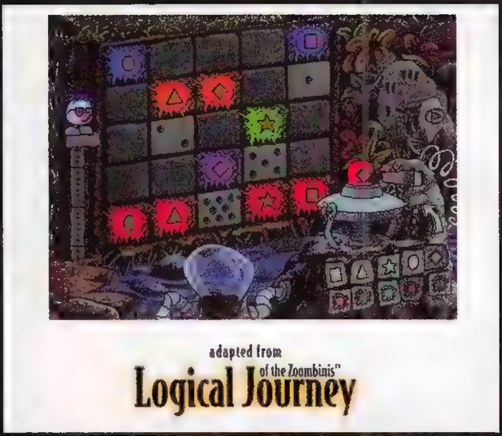
I set my movie properties here in this window.

9 The movie's finished. It runs well. I go to Movie and choose Properties from the Modify menu to confirm the movie parameters. The Stage Size can be changed here and I can make certain that the stage color is, indeed, registering as black. Everything looks good. Nothing needs to be changed.

Shocked Sites

You can surf... for inspiration

Here are three of the author's favorite Shockwave sites. "Visit them to see the variety of things you can create with *Director* in hand.


adapted from
of the Zoombinis"
Logical Journey

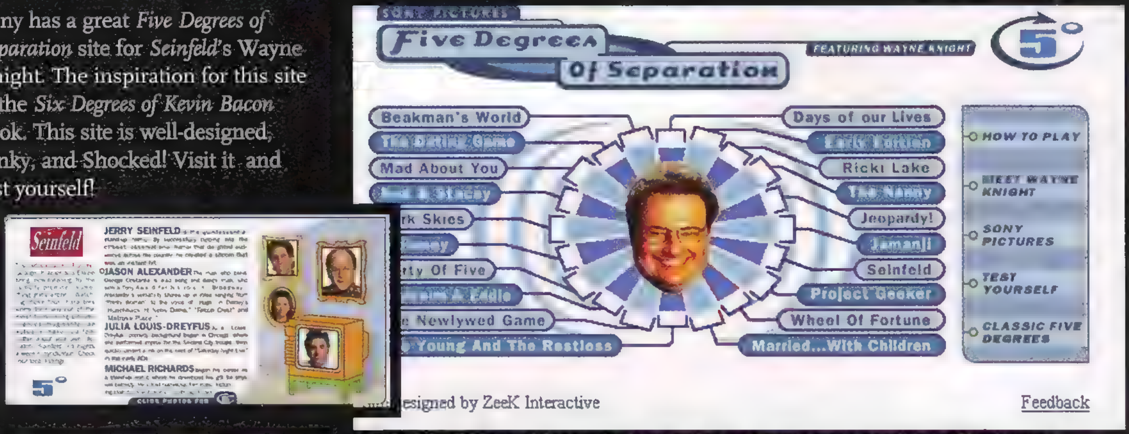
MudBall Wall by Broderbund. Tons of Shockwave fun and sound.

www.broderbund.com/studio/activemind/mudball.html

Mudball Wall. Visit this site and experience one of the most fun sites on the web. Broderbund's *Logical Journey of the Zoombinis* CD-ROM is a great learning game for kids and this Shockwave movie is an interactive game based upon the CD-ROM! The challenge is to "hit" all of the numbered stones on the wall to free the Zoombinis. It's also great that Broderbund has the guts *not* to include any directions on the page. If you weren't in an interactive and curious mood, you might never discover that this beautiful "image" is actually a game. Here's a clue: Click on the blinking arrow to begin. To tell any more would be to ruin the fun and fascination of this glorious site.

www.spe.sony.com/Pictures/tv/5d/main.htm

Sony has a great *Five Degrees of Separation* site for *Seinfeld*'s Wayne Knight. The inspiration for this site is the *Six Degrees of Kevin Bacon* book. This site is well-designed, funky, and Shocked! Visit it and test yourself!


Five Degrees
Of Separation
FEATURING WAYNE KNIGHT
5°
Beakman's World
Mad About You
rk Skies
rty Of Five
e Newlywed Game
Young And The Restless
Days of our Lives
Ricki Lake
Jeopardy!
Seinfeld
Project Geeker
Wheel Of Fortune
Married...With Children
HOW TO PLAY
MEET WAYNE KNIGHT
SONY PICTURES
TEST YOURSELF
CLASSIC FIVE DEGREES
esigned by ZeeK Interactive
Feedback
Seinfeld
JERRY SEINFELD
JASON ALEXANDER
JULIA LOUIS-DREYFUS
MICHAEL RICHARDS
5°

Sony's *Five Degrees of Separation* is an online web game made possible by Shockwave.

home
shockwave
software
sales
techsupport
reference
services
macromedia
help
MACROMEDIA
shockwave
MADE WITH
M
MACROMEDIA

Macromedia's animated logo has been Shocked into a movie experience.

www.macromedia.com/shockwave/director5/moviedocs/made_mm.html

Macromedia's Shockwave Movie Lab gives you the chance to see a wide variety of examples of *Director 5.0* Shockwave movies made specifically for the web and download the source code to see how the movie was created.

Since these files are **self-playing**, the **1.7-second** movie runs over **1.6MB** as an **executable** file!

project

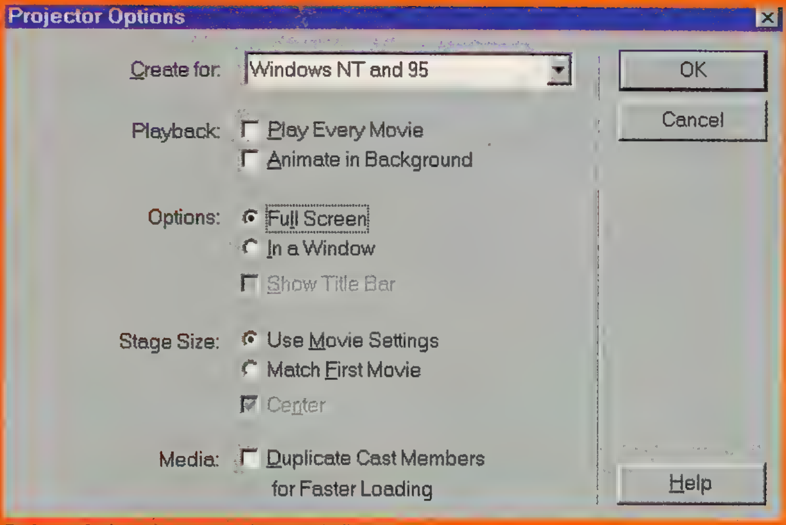
Now the movie is edited and a "Projector" must be created out of the file so it can be played outside of *Director*. Since these files are self-playing, file size can be quite large, and true to form, the 1.7-second movie runs over 1.6MB as an executable file!

Still, creating a projector version of the movie is important. Before running it through the Shockwave Afterburner Xtra, I need to view the movie in a stand-alone state to see if it holds together.

From the File menu, I select Create Projector and add the boles.dir file.

Clicking Options in the Create Projector tells *Director* how the file should be played. I choose Full Screen, and tell it that the file is to run under Win95 and NT.

This projector file is on the *bootDisc*. The filename is blkboles.exe.


Projector Options
OK
Cancel
Help

Create for: Windows NT and 95

Playback: ☐ Play Every Movie
☐ Animate in Background

Options: ● Full Screen
○ In a Window
☐ Show Title Bar

Stage Size: ● Use Movie Settings
○ Match First Movie
☑ Center

Media: ☐ Duplicate Cast Members for Faster Loading

Projector Options are selected for my EXE file here.

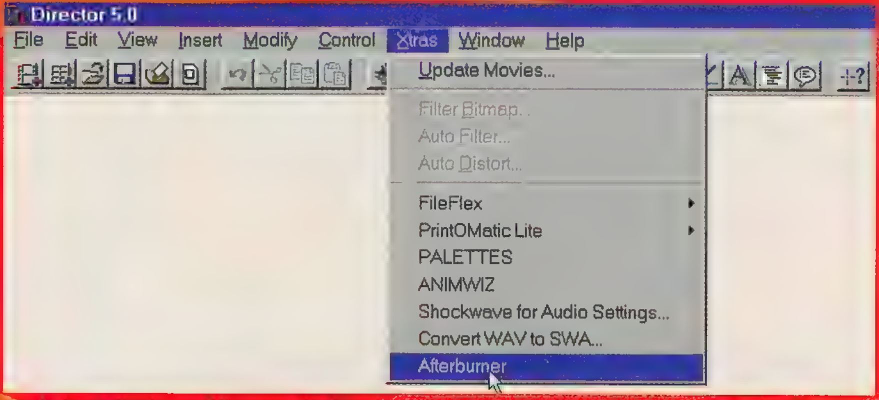
burn

In order for a *Director* movie to play on the web, it must be run through Macromedia's Shockwave Afterburner Xtra (which is available from the Macromedia web page at **www.macromedia.com/shockwave/devtools.html#director**.

Unfortunately, you'll have to go download it yourself because Macromedia doesn't allow anyone to publish the *Director 5.0* Afterburner Xtra on CD-ROM.

Choose Xtras from the file menu and select Afterburner from the drop-down menu. (Note: If you don't see Afterburner listed on the Xtras menu, then it hasn't been properly installed.)

I name my Shockwave file "blkboles" and save it with a DCR extension. The web server will need to read that extension to recognize the movie as a Shockwave file. The DCR extension also minimizes download time for visitors.


Director 5.0
File
Edit
View
Insert
Modify
Control
Xtras
Window
Help
Update Movies...
Filter Bitmap...
Auto Filter...
Auto Distort...
FileFlex
PrintOMatic Lite
PALETTES
ANIMWIZ
Shockwave for Audio Settings...
Convert WAV to SWA...
Afterburner

Here's where Shockwave Afterburner for *Director 5.0* appears on the drop down menu if it's installed properly.

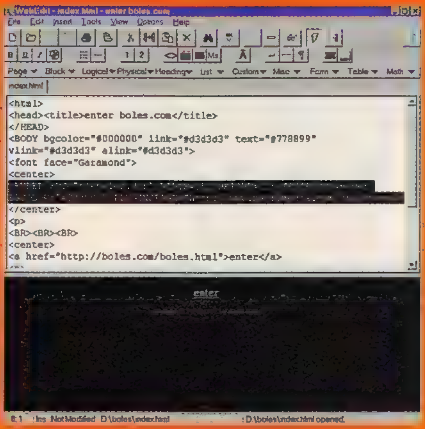
(Note: Ask your ISP or web administrator if their server is configured to play Shockwave movies. To set up a server to stream Shockwave movies, check out **www.macromedia.com/shockwave/config.html** for detailed directions for configuring your server.)

embed

Now it's time to embed the Shockwave *Director* movie in the web page's HTML code Here's the code for my site:

```
<EMBED SRC="blkboles.dcr"
WIDTH=352 HEIGHT=225 TEXTFO-
CUS=never
BGCOLOR="#000000"
PLUGINSPAGE= "http://
www.macromedia.com/shockwave">
```

The PLUGINSPAGE code URL will invite visitors on the site to download the Shockwave Plug-In from Macromedia if their browser is unable to read my Shockwave movie.


WebEdit - index.html - enter boles.com
File
Edit
Insert
Tools
View
Options
Help
Page
Block
Logical
Physical
Heading
List
Custom
Misc
Form
Table
Math
index.html
enter

```
<html>
<head><title>enter boles.com</title>
</HEAD>
<BODY bgcolor="#000000" link="#d3d3d3" text="#778899"
vlink="#d3d3d3" alink="#d3d3d3">
<font face="Garamond">
<center>
[illegible]
</center>
<p>
<BR><BR><BR>
<center>
<a href="http://boles.com/boles.html">enter</a>
```

The highlighted text in my index.html page for boles.com is the Shockwave EMBED code.

done

I came up with an idea, applied it to the limitations of the technology, created a *Director* movie, and posted it on my web site as a Shockwave movie. I think the movie works well. It's quick, unique, and hopefully, intangibly unforgettable!

David W. Boles is the Publisher and Editor in Chief for Internet Insider *magazine found online at* **goinside.com**. *He is the author of more than 26 articles and his work has appeared in* Windows, Web Techniques, *and* cIEx *magazines. Mr. Boles is the author of the international best-seller* Windows 95 Communication and Secrets *published by IDG Books Worldwide. You can write to him c/o* david@boles.com.

GATEWAY SU
PACKARD BELL NE
SONY AST MICRO
FUJITSU TEWA

Fresh from the sketchpads of the most **fabulous** designers of Paris, New York, and Sioux City the best of the **spring** lineup parades its wares on *boot*'s runway. This year's **models** are dressed and ready to **strut**, so let's get to the **show** floor right now.

the IN crowd

BY TIM TULLY

The Spring Scene for PCs is Hot Hot Hot!

Gateway 2000 Solo 2200-166

Gateway's spring strategy is to adorn its customers with built-to-order machines. Still, while the keepers of the Gate are eager to help you accessorize, one ensemble leads the parade.

The Solo 2200 notebook comes with a 2GB hard disk this season, but product manager Jason Glover thinks 3GB drives will be right for fall. He also expects the cool autumn weather to replace 8x CD-ROM drives with hotter 16x units. "I think all new software will take advantage of higher speeds," says Glover. "It's being driven by software, and consumer demand and perception. Ultimately, it's up to the customers' perceptions and desires, and our customers are demanding (very loudly) that they want more speed and performance." Glover says the Solo 2200 is "probably set up as well as any notebook could be for gaming." MMX play, great display, and a joystick input back up his claim, as do the Chips & Technologies 64-bit graphics accelerator, software MPEG 1 playback, ESS ES690 wavetable synthesizer chipset, and 1878S 16-bit full duplex audio. Glover says 56.6Kbps modems are still above the 1997 hemline, but he's seen rough models work in the labs, and thinks the technology will be good for surfing over POTS.

Enhancing both the web and gaming experience is the 2200's 12.1-inch active matrix, SVGA screen, and its ability to display simultaneous 800x600 external video via NTSC and PAL outputs. The integrated screen displays 65k colors, and the machine can pump 64 million colors to an external monitor. The zoomed video port allows input of 32-bit video graphics from a CD-ROM or other source.

speeds and feeds

the price	$TBA
CPU	166MHz MMX
Cache	256k L2
System Memory	80MB
Hard Disk	2GB
CD-ROM Speed	8x
Expansion	Two Type II PC slots
Video	Chips & Technologies CNT5554 chipset; 2MB EDO VRAM; 64-bit graphics accelerator on the motherboard; MPEG 1 software
Video I/O	NTSC and PAL outputs; video input for 32-bit video graphics
Display	2.1-inch active matrix, SVGA, 800x600, 65k color Zoomed Video port
Fax/Modem	Telepath 33.6 fax and cellular
Audio Solution	Wavetable ESS ES690 wavetable music synthesizer; ESS 1878S 16-bit full duplex
Audio I/O.	1/8-inch stereo line-outs; headphone-out, mic-in
Gamer Features	Joystick input
USB Ports	No
IrDA Port	Yes
DVD	No
Removable Storage Options	Either or both of the modular CD and floppy drives can be installed

PHOTO ILLUSTRATION: LAURA MORRIS

Spring
SYSTEMS

speeds and feeds

the price $2,738

CPU	200MHz MMX
Cache	512K L2
System Memory	32MB EDO RAM
Hard Disk	2.5GB
CD-ROM Speed	12x
Expansion	Three ISA; three PCI; one shared
Video	Diamond Stealth 3D 2000 with S3 ViRGE chipset; 4MB EDO VRAM
Monitor	Micron 15-inch 0.28 DP, 1280x1024
Fax/Modem	No
Audio Solution	Sound Blaster 32, wavetable 16-bit duplex
Audio I/O	Standard; mini-plugs
Speakers	Advent AV 370 powered speakers w/ subwoofer
Gamer Features	Micron excitement pack with *Pod*, *Eraser*, *Blockbuster Guide to Movies & Video*, Adobe *Photo Deluxe*
USB Ports	No
IrDA Port	No
DVD	No
Removable Storage Options	Zip drive

Micron Millennia MXE 200

Probably the most distinguishing feature of the new Micron Millennia MXE 200 is the Sound Blaster 32—the OEM version of the excellent AWE32 sound card. Supported by a 200MHz MMX Pentium, 32MB of RAM, a 2.5GB hard drive, and a Diamond Stealth 3D 2000 video card with the S3 ViRGE chipset, the Millennia promises to be a multimedia, gaming delight.

Another pleasant surprise is the model's optional inclusion of a Kodak DC20 digital camera, which, along with the bundled Adobe *Photo Deluxe* software, adds design-studio fun to this number. The Millennia also ships with other MMX-enabled applications, including the *Blockbuster Guide to Movies & Video*, and 3D games *Pod* and *Eraser*.

Together, this set of hardware and software make the Millennia a genuine multimedia workstation, able to create, capture, edit, and output visual and audio media.

Micron Director of Desktop Product Marketing, Jeff Moeser, calls the Millennia "the ultimate multimedia machine," and addressed the question of the MMX chip relieving the computer of the need for such hardware as sound cards. "There's no product out there that does that yet," says Moeser. "Eventually, you'll be able to run a lot of things—first, software wavetable and then fax. But those things suck up MIPS, and for gamers, that's going to slow things down. Maybe at a more entry-level position—a $1,000 machine—but not for gamers. It'll happen eventually, and maybe this year, but at the cost of some MIPS somewhere else in the machine."

The Millennia also includes a 12x CD-ROM drive, Iomega Zip drive, a 1280x1024 15-inch monitor, and a pair of Advent AV 370 powered speakers with a subwoofer.

Moeser says Micron aims to differentiate itself from its competition by offering "the fastest systems around. [Micron has] won a lot of prizes and we'll continue on that tack. We'll always push the high end." He expects to ship systems that comply with Microsoft's PC 97 spec "very, very shortly... sometime this year."

Gateway Destination Pentiun Pro 200 (D6-200)

Breaking the traditional one-PC-to-one-user mold, the Gateway Destination Pentium Pro 200 is specifically designed for a group environment and interactive applications. It gives mom, dad and the kids the PC experience together, in the living room.

Imagine making your Internet fashion statement on the couch!

Stacy Hand, Product Marketing Manager for the Destination, says the D6-200 is a response to Gateway customers' desire for the biggest and the best. Passé is the set-top box approach to ensconcing the PC in the family room; Gateway has heard the hue and cry for an integrated system with no obsolescence. Hand says that the Pentium Pro—as opposed to the MMX Pentium—takes advantage of 32-bit applications and rock-solid Windows NT, adding: "We took that up for our customers in the family PC line. We feel that a year from now, 32-bit is what's going to be there. The Pro will outperform the MMX in many applications."

Designed for families with kids, the Destination Pentium Pro 200 is a perfect number for the fashionable family that plays a lot of games. To project the computing experience to a group, the Destination sports an impressive multimedia array of accessories. A TV tuner in the PC displays the TV video on a huge, 31-inch screen, and to coordinate with the Destination's powerful P-Pro processor, Gateway includes the Ensoniq Vivo90 sound card. One of the best in the business, the Vivo records and plays digital audio with up to a 48kHz sampling rate, and more than a 90dB signal-to-noise ratio. A 32-voice wavetable synthesis, using Ensoniq's well-crafted sound samples covers your MIDI synthesis needs.

The Destination delivers sound to your home through one of the most formidable computer sound systems around: Television audio is amplified and processed by a Dolby ProLogic receiver, and along with the sound card output, is pushed through a Harmon/Kardon five-speaker-plus-subwoofer high-fidelity surround sound system.

Gateway 2000 G6-200 XL Family PC System

Gateway 2000 doesn't only insist on putting high-end PCs in your family room. If you want such family-friendly features and functions as multimedia and games in a traditional one-on-one system, the G6-200 Family PC is the right outfit for staying inside and warm on those cold, wet spring days.

As well as using the fast and fashionable 200MHz Pentium Pro processor, the Gateway Family PC system includes such goodies as a 5.1GB Maxtor hard drive, 64MB of EDO DRAM, and a CD-ROM drive with a 12x maximum read speed to let you suss out Carmen Sandiego's wardrobe with virtually seamless realism.

Portable storage is handled by an internal Iomega Zip drive, and for the fashion plate who needs to archive immense blocks of data, or for multimedia producers looking to parade their creations portably, the system offers a 2x write/4x read Panasonic Recordable CD-ROM drive. Speaking of multimedia, it's undeniably in style on this system. The Ensoniq Vivo90 sound card provides top-notch digital audio and MIDI wavetable synthesis. An Altec Lansing speaker system with a pair of ACS-410 speakers and an ACS-251 subwoofer round out the audio accessories.

While the system skrimps just a tad with its junior-sized, 15-inch monitor (the CrystalScan 700), it does use the STB ViRGE/VX 64-bit accelerator with 4MB VRAM for 2D and 3D graphics.

For communication with the outside world, the G6-200 is outfitted with a 33.6Kbps Telepath fax/modem. Six expansion slots include three PCI slots, three ISA slots, and one shared slot, making this a worthy successor to last year's model.

speeds and feeds

the price	$3,799
CPU	200MHz Pentium Pro
Cache	256 L2 secondary cache
System Memory	64MB EDO DRAM
Hard Disk	5.1GB Maxtor
CD-ROM Speed	Panasonic 2x write/4x read Recordable CD-ROM with controller
Expansion	Three ISA; three PCI; one shared
Video	STB ViRGE VX OEM version of Velocity; 64-bit 3D
3D Graphics Acceleration	None
Fax/Modem	33.6 telepath
Audio I/O	Mini-plugs, stereo I/O, mic-in, phones-out
Speakers	Altec Lansing ACS-410 and ACS-251 subwoofer
Gamer Features	None standard
USB Ports	No
IrDA Port	No
DVD	No
Removable Storage Options	Internal Iomega Zip

The family controls the Destination with an RF-based, wireless keyboard and a remote with an integrated trackball, called the "Field Mouse." And, to make your PC data portable, this *boot*-preferred system is configured with an internal Iomega Zip drive.

speeds and feeds

the price	$4,307
CPU	200MHz Pentium Pro
Cache	Internal 256k cache
System Memory	64MB
Hard Disk	3.8GB
CD-ROM Speed	12x Mitsumi
Expansion	Three 32-bit PCI slots; three 16-bit ISA; one shared
Video	TV tuner built in; VGA graphics
3D Graphics Acceleration	No
Fax/Modem	33.6 US Robotics
Audio Solution	Ensoniq Vivo90
Speakers	Come with Harman/Kardon surround sound; Dolby ProLogic receiver, five-speaker surround plus subwoofer center
Gamer Features	Two-joystick Y-cable
USB Ports	No
IrDA Port	Replaced by RF-based wireless keyboard and remote with integrated trackball
DVD	No
Removable Storage Options	Internal IomegaZip

Hewlett-Packard Pavilion 7370V

"Well designed for gaming." is the way Vicky Goldberg, Hewlett-Packard's Senior Product Manager for high-end entertainment, describes the 7370V.

Built around a 200MHz MMX Pentium, 32MB RAM, and a 4GB hard drive, this model is a voluptuous video vision. The S3 ViRGE chipset handles 2D images, while the Voodoo Graphics 3D graphics accelerator card—adorned with 6MB of VRAM—makes the models jump right off the runway. Like every Pavilion, the 7370V is bundled with HP's imaging, art and library software. Hewlett-Packard is also enthusiastic about creating an interactive relationship with its customers through an award-winning out-of-box-experience and the unique HP web site, hp@home. Anyone buying any HP Pavilion model can go to the Pavilion site, free, for six months. HP is using the site to build a relationship with customers by providing help, fixes, and other services.

Enhancing the thrill of multimedia is HP's multimedia keyboard. This adaptation of the old QWERTY favorite features specialized keys offering one-touch access to various interactive and multimedia functions. One button controls the CD player's shuttle functions, volume and mute; another—along with a warning light that tells you when you have a message—controls the telephony system, including answering and hanging up the phone. Specialized software lets each user customize shortcuts to speed up his or her favorite apps.

Ensuring the audio quality of the 7370V was a priority. Despite Intel's assertions that the MMX Pentium obviates the need for a sound card, Chris Pedersen, HP Worldwide Brand Manager for Home Products, says, "Sound is getting to be relatively inexpensive, and we could have gone to a software solution. But you take a big performance hit, especially with the wavetable. This is less true for the MMX, but when you're playing a game, you want the best frame rate and the best graphics you can get." And, as good as the sound is on the 7370V, it's just a preview: "Our research and focus groups tell us sound is a very high value," Pedersen said, "and we're improving our whole system. You'll see more in '97."

Hewlett-Packard cited delays in the delivery of the DVD decryption chip, causing absence of a DVD drive in the 7370V, but believes that Pavilions arriving this summer will sport a DVD in place of the CD-ROM drive, which will play MPEG 2 and Dolby AC3.

speeds and feeds

the price	$2,699 (w/o monitor)
CPU	200MHz MMX
Cache	256 L2 PLB
System Memory	32MB EDO DRAM
Hard Disk	4.0GB
CD-ROM Speed	16x max
Expansion	Five ISA and two PCI
Video	S3 ViRGE chipset
3D Graphics Acceleration	Voodoo Graphics 3D accelerator card with 6MB VRAM
Monitor	No
Fax/Modem	No (33.6 coming April/May)
Audio Solution	Yamaha OPL3-SA and OPL4-ML chips; Spatializer 3D surround; software bass & treble control
Speakers	Two Altec Lansing speakers can plug into monitor, which adds a bass boost and Altec subwoofer; 14- and 15-inch monitor offer 5W per channel; 17-inch monitor has 10W per channel and 20W subwoofer
Gamer Features	Logitec ThunderPad, 3D effects games: *MechWarrior 2* and *Whiplash*
USB Ports	Two
IrDA Port	No
DVD	Summer '97
Removable Storage Options	No

Packard Bell-NEC Platinum 2280

For home or home office, Packard Bell-NEC's top of the line Platinum is no-nonsense workwear. The 2280 comes on strong with a 200MHz Pentium processor, 64MB of RAM, and a beefy 4GB hard disk. The S3 ViRGE chipset handles video and 3D through a 17-inch, 0.28 dot pitch monitor. Two USB ports on the MMX Platinum emblemize its eye for the near future, giving it plenty of potential of more media for the money. Jack Yovanovich, Platinum Product Manager, feels USB is ready for prime time. "Most of the systems that ship this year will have USB ports," he said. "You'll see it across the board and see the serial port disappear, maybe as soon as the latter part of this year."

The audio system is a curious mixture: The audio chipset is a simple Sound Blaster clone integrated with the fax/modem—a design bound to induce noise into both digital audio and MIDI playback. The good news is that it is eminently

Spring
SYSTEMS

Fujitsu 655Tx LifeBook

The Fujitsu 655Tx is the perfect mannequin: ultra-light (4.2 pounds) and ultra-thin (1.2-inches). With this model, Fujitsu adds 150MHz MMX technology to its LifeBook series. The multimedia-ready 655Tx is ready-for-fun actionwear, playing back MPEG 1 on a 12.1-inch SVGA, active-matrix screen using 16.7 million colors. The screen is resolved at a sleek 800x600 and is supported by 2MB of VRAM.

Fujitsu Director of Product Marketing Bert Parekh says the 655Tx not only gives its users MMX processing speed, but "the biggest screen and largest drive in the lightest, thinnest possible package." Like the rest of the LifeBook line, the 655Tx is meant for comfort as well as speed, even down to such tiny details as the retractable feet that lend a wrist-saving 6° tilt to the keyboard. Specialized power-management software increases the life span of both the lightweight lithium-ion battery and optional second battery.

On the road, the 655Tx is all business, including an onboard 33.6Kbps modem and optional Internet connection software. But back home on the desktop, it cozys up to an optional enhancement unit that creates a complete ensemble featuring such multimedia-oriented features as an 8x CD-ROM drive and MIDI/joystick port, as well as a floppy drive.

The unit's extreme compactness does demand some tradeoffs. Audio is produced only by a Sound Blaster-compatible system using the passé FM synthesis, which will diminish any multimedia experience.

speeds and feeds

the price	$4,500
CPU	150MHz MMX
Cache	256k L2
System Memory	16MB
Hard Disk	1.3GB
CD-ROM Speed	8x (in enhance ment unit)
Expansion	Two type II PC card slots
Video	Trident MPEG 1 playback; Zoomed Video
3D Graphics Acceleration	No
Display	12.1 SVGA
Fax/Modem	33.6Kbps
Audio Solution	16-bit Sound Blaster-compatible (FM synthesis)
Audio I/O	Stereo-out, mini-plugs
Speakers	One speaker in notebook, two in enhancement unit
Gamer Features	MIDI/joystick port (in enhancement unit)
USB Ports	No
IrDA Port	Fast IR
DVD	"When it becomes portable"
Removable Storage Options	No

upgradable. "Our general philosophy is to provide low-cost solutions that appeal to the consumer," says Yovanovich, "and spending money on wavetable doesn't appeal to most users." Still, an upgrade to the Wavestream software wavetable system is available and the 2280 is equipped with two audio enhancement features. It has the SRS Surround Sound system and the BBE Enhanced Sound feature, which uses sophisticated audio algorithms to add intelligibility to narration and top-end brightness to all sounds.

The machine is also configured ready to connect to DVD, Dolby AC3 surround, and any S-Video source. The Brooktree video decoder is also available, providing accelerated video conferencing.

The design of the 2280 chassis is a stunning fashion statement. Its "Designer Tower" configuration makes it a low form-factor minitower by putting the mother board in the base of the unit in a perpendicular orientation. The Media Select console adds another touch of convenience for the user by providing one-touch access to multimedia and telephony.

With its speed and forward-looking features, the Platinum 2280 is a top pick for home or business.

speeds and feeds

the price	$3,199
CPU	200MHz MMX
Cache	256MB PLB L2
System Memory	64MB EDO RAM
Hard Disk	4.3GB
CD-ROM Speed	16x max
Expansion	Five: Two PCI; two ISA; one shared (used by modem)
Video	S3 ViRGE 2MB EDO VRAM, MPEG 2
3D Graphics Acceleration	ViRGE built in
Fax/Modem	33.6Kbps
Audio Solution	Sound Blaster clone on modem Wavestream Software wavetable upgrade; SRS theater and BBE enhancement
Speakers	Packard Bell wing-mounted speakers (approx. 2-inch speakers)
Gamer Features	No
USB Ports	Two ports
IrDA Port	Support in system but no transceiver built into I/O controller
DVD	No
Removable Storage Options	Internal Zip

Spring
SYSTEMS

NEC Versa 6200 Notebook

One of the first things you notice about the NEC Versa 6200 Notebook is its big, bright 13.3-inch screen, offering a viewing area the size of a standard 15-inch monitor. The 64k-color display is high-contrast and low reflectivity, and makes for an impressive viewing experience. This quality is not surprising considering that NEC owns the world's largest TFT screen manufacturing plant.

Jim Schwabe, NEC's Portable Systems Division Senior VP, points out that this gives NEC "a longer lead time so [they] can develop notebooks around any new technology, and assures [them] of a stable supply, especially of 13.3-inch screens, where the manufacturing is more difficult than for smaller screens." While the Versa can use this screen to display the gamut of computer imagery, including full-motion MPEG 1 video, it can also plug into an external TV monitor via an NTSC/PAL video output, or to a projection system via a monitor port.

And its display options are not the only way in which the Versa is truly versatile. It sports two PC card slots, and a single bay which can hold either a floppy drive, a CD-ROM drive, or an Iomega Zip drive.

For all its admirable features, the 6200 does share the mediocre audio common to most portables, boasting no more than Sound Blaster Pro compatibility, including FM synthesis. Schwabe offers a rationale for this, stating that a top PC needs top audio for consumers, "but business people may not need sound at all. I think you should always have sound on a notebook, but the question is the quality. E-mail and spreadsheets don't need much, but sales demos and presentations certainly do."

Following this train of thought, NEC offers an anodyne for audio, modem, and other limitations dictated by portability. This comes in the form of the NEC Docking Station 6000. The 6200 can dock with this unit to gain three PCI slots, two drive bays, a SCSI 2 connection, and all audio ports plus a telephone jack and MIDI/joystick port. If you can live with FM synthesis on the road, the docking station and a good wavetable sound card provide a good solution.

speeds and feeds

the price	$6,399
CPU	166MHz MMX
Cache	256MB L2
System Memory	32MB (expandable to 128)
Hard Disk	2GB
CD-ROM Speed	10x
Expansion	Two PC (one type III or two type II)
Video	Chips & Technologies 6555; 2MB VRAM; Zoomed Video; NTSC-out
3D Graphics Acceleration	Hardware assisted MPEG; no card
Display	13.3-inch TFT, 64k colors, 1024 x 768 XGA
Fax/Modem	No
Audio Solution	16-bit Sound Blaster Pro compatibility
Audio I/O	Stereo-in and out; headphone-out w/ volume port, mic-in, 1/8-inch jacks
Speakers	One speaker in notebook, two in enhancement unit
Gamer Features	No
USB Ports	No
IrDA Port	Fast IR
DVD	No
Removable Storage Options	Modular floppy drive can be swapped with hard disk, CD-ROM, or Zip drive

Sony PCV-120

Although Sony only entered the home PC market last year, it isn't acting like the new kid on the block, and the new PCV-120 is an example.

Running off a 200MHz MMX Pentium, the PCV-120 gets hot 3D from the ATI Rage II 3D graphics chip and connectivity from a 33.6Kbps DSVD (Digital Simultaneous Voice and Data) modem. A 16x CD-ROM drive, Sony's proprietary "Sony Tuned" software MPEG decoder, and an NTSC/PAL video output make the PCV-120 an all-season video ensemble. While it doesn't have a DVD drive, it is DVD-ready by dint of its two drive bays. Sony is also eager to point out that they plan to ship future models with internal DVD drives, prototypes of which the company demonstrated at the winter CES show.

The future may also sound brighter for Sony. At the moment, the company "is not doing anything special on the wavetable side," according Tac Sugiyama, Sony Director of Marketing for PC Products. Rather, they are using the Yamaha OPL3 chipset.

By March however, a new, 17-inch "Multimedia Display" monitor will be available that could add some color to the PCV-120's audio palette. This CPD-220VS will offer dynamic 3D sound and enhanced bass performance via two 3.5-watt speakers and a 10-watt subwoofer. The display will have a built-in microphone and a USB pass-through port.

On the visual side, the monitor will feature "Graphic Picture Enhancement" designed to brighten and sharpen edge details. It can be set to any of three modes for graphic presentations, video gaming, and MPEG video. The monitor will support multiple resolutions up to 1280x1024 at 60Hz with a 0.25mm aperture grille pitch.

Sugiyama also hinted at other future improvements, saying, "Wavetable is only part of the story. We're very dissatisfied with the quality of audio in the PC market, but it's the result of the whole system design. Microsoft's PC 97 will help, but to get the kind of signal-to-noise ratio you expect from a hi-fi system, you have to redesign the board. The digital operations inside a computer create a lot of high-frequency noise that must be eliminated. To satisfy true hi-fi people, we're looking at separating the board from the entire audio system." He pointed out that this redesign

AST Notebook (Name TBA)

AST is in the process of bringing out three new MMX systems by mid-year. One of these, according to Rick Stever, Manager of Global Mobile Marketing, "will use the Intel core logic set, but the others are somewhat cautious about MMX from a heat standpoint."

The new notebooks will be designed as two-piece units, the top being a lightweight (less than five pounds) portable and the bottom serving as a docking station holding a CD-ROM drive, floppy drive, and an extra battery. A floppy drive will also be attachable to the top piece with a cable. Together, the two units will weigh less than seven pounds.

Stever questions the presence of an MMX chip in a notebook. "MMX brings multimedia into a stronger position," he says, "but how many notebook users use multimedia now? Still, MMX will improve performance across the board, even for non-users of multimedia." He also said AST will be "fully into MMX from mid- to late-1997, for commercial as well as consumer machines, depending on Intel's road map."

Still, AST is planning to include a 10x CD-ROM drive, Cirrus 755 video subsystem with 2MB EDO VRAM, wavetable synthesis, a USB port, and Fast IR in its notebooks. Stever says the issue of user demand and power requirements will determine when DVD drives start appearing in notebooks. He indicated that it might be as late as 1998.

Stever cited AST's close connection to consumer electronics giant, Samsung, as a valuable source of consumer products and R&D, which will help AST to converge the PC and the consumer market. "We're probably the only computer company associated so closely with such a powerful consumer company, and our engineers have been talking."

speeds and feeds

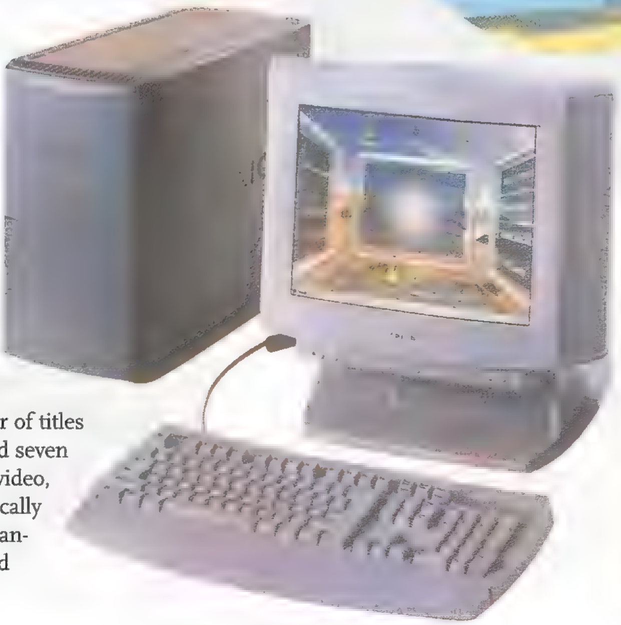
the price $3,000 to $3,500

(preliminary)

CPU	166MHz MMX
Cache	256k L2
System Memory	32MB Synchronous DRAM
Hard Disk	2.1GB
CD-ROM Speed	10x max
Expansion	Two Type II and one type III PC card slots
Video	Cirrus 755 subsystem 2MB EDO VRAM
3D Graphics Acceleration	Don't know 3D's all that relevant to notebooks yet
Fax/Modem	33.6Kbps
Audio Solution	Wavetable "should be there"
Speakers	At least two
Gamer Features	No
USB Ports	One port
IrDA Port	FASTIR
DVD	No
Removable Storage Options	No

could add $1,000 to the consumer price tag today, and may not be viable until 1998 or 1999.

Another major feature of the new machine is free 24/7 customer support and a one year warranty that includes free on-site service. The system comes with a number of titles including *Encarta* and seven others using MPEG video, plus two titles specifically enhanced to take advantage of the accelerated 3D graphics chip.



speeds and feeds

the price $2,399

CPU	200MHz MMX
Cache	512K L2
System Memory	32MB
Hard Disk	3.8GB
CD-ROM Speed	16x max
Expansion	Three PCI; two ISA; one shared
Video	2MB EDO VRAM. "Sony tuned" software MPEG decoder
3D Graphics Acceleration	ATI Rage II 3D graphics chip
Monitor	Not bundled; 15-inch ($529) available; 17-inch available in March
Fax/Modem	33.6Kbps
Audio Solution	Yamaha OPL3 chipset
Audio I/O	Stereo-in and -out mini-plugs
Speakers	None; speakers, subwoofer, and mic built into video monitors
Gamer Features	No
USB Ports	Supports the camera only; on future monitor
IrDA Port	No
DVD	No. 2 slots for five 1/4 in drive make it DVD-ready
Removable Storage Options	No

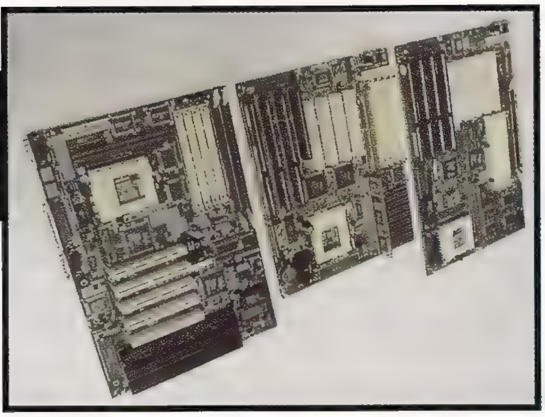
the boot 12-step program

DEALING WITH YOUR PC **OBSESSION** DAY TO DAY BY BREAKING IT DOWN INTO 12 **EASY** STEPS

this month: *Motherboard Makeover*

Your SIMM sockets are dusty, clogged pores dotting your motherboard's surface; your BIOS version dates back to the last Republican presidency; and your ISA expansion slots have developed more wrinkles than a sack of prunes. In short, you have an old system that's just too pooped to take any more upgrades. Adding to your motherboard would be like Tammy Faye Bakker applying another layer of makeup. What you need is a complete makeover, and this month's 12-step walks you through to a new you.

— *Sean Downey*



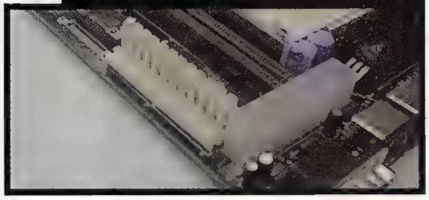
① Momma bear, baby bear, and poppa bear. Otherwise known as ATX, baby AT, and AT.

1 Understand Your Bone Structure

MMX is here! Can your system take it? You'll need a motherboard that can handle the different voltage requirements an MMX CPU brings with it. Luckily, most of the *new* PCI boards come with voltage regulators and the appropriate settings that will allow MMX processors to do their voodoo on you. Choosing a brand-name board will give you a leg up and flash BIOS upgrades are indispensable. There's nothing more sad than a kick-ass motherboard running a pathetically old BIOS. (A Plug-and-Play BIOS is getting to be a necessity.)

Most motherboards fall into three form factors: AT, baby AT, and ATX. Since the latest ATX specs for version 2.0 were just released in December, your old case will most likely not work with them, but this new form factor takes into account advanced cooling and design features. If you're unlucky enough to own a nonstandard motherboard, specifically designed for your case, then you'll need to talk to the manufacturer about upgrade options.

This particular board has both types of power connectors. A split-plug connects to the one on the left. ③



2 Exfoliate Dead Skin

Write down your CMOS settings before swapping out your motherboard. Although most current BIOS's automatically detect and configure IDE hard drives, it's still a good idea to jot down your old settings in case the new BIOS identifies the drive differently than the old one.

Taking apart your system on carpet is not recommended, so find a well-lit table to perform your operation on. Unplug the power and remember to ground yourself by touching your computer's metal frame early and often to discharge any built up static electricity.

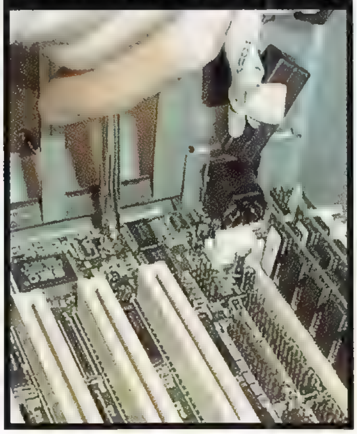
④ If these aren't properly labeled, you'll need to trace them back to their source to figure out what each one does.

3 Pluck, Pluck, and Pluck Some More

If you can access the power connector through all the wires and cables, check to see what type is on your motherboard. We had difficulties when we discovered new 20-pin Molex connectors on several of the system boards we were replacing, and since the replacement boards all had the standard power connector, we were SOL. Unless you're planning to replace the power supply while your case is open, the new motherboard's power connector must match the old one.

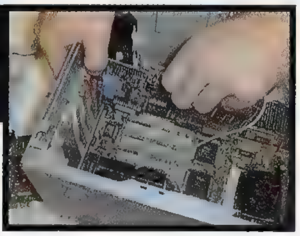
The power connector will either be a split plug with eight multicolored wires running into each of them, or a single Molex connector. The split plug is usually held in place by plastic hooks, and unplugging involves pulling them partially out and then gently pushing them down and to the side. The Molex plug is more easily removed with a simple tug. Now is a good time to disconnect the power supply to all the other devices in your system.

Remember: Righty-tighty, lefty-loosey. ⑥



4 Mask for Your Particular Skin Type

Disconnect ribbon cables, such as your serial, parallel, IDE, and floppy connectors from your motherboard. You should replace the old serial and parallel ports with the new ones that come with your motherboard. You don't have to unplug your IDE and floppy cables from the drives they're connected to, unless they get in the way. Some systems' drive bays are sufficiently out of the way for a baby AT motherboard, but may end up obstructing a full-length AT board. Disconnect the thin wires powering your LED lights (HDD, power indicator, etc.), reset button and key lock. Note what goes where and label them, if they aren't already labeled.



⑤ Be careful... this is where Jim cut his finger.

5 Moisturize Your Puffiness Away

Remove all of your expansion cards from the motherboard slots. Handle the cards by the mounting bracket or circuitboard edges, *never* by the gold connector strip. You can leave the wires and cables attached to expansion cards, as long as you have adequate room and don't let the cards drape into any place they shouldn't.

⑥ Unless you're extremely muscular and have big thumbs, you can't just push these standoffs through the hole.

6 Use Revealing Colors, Not Concealing Layers

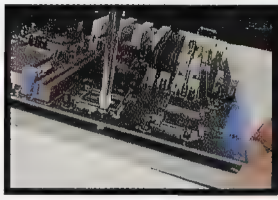
Now remove the screws holding the motherboard to the case. Keep track of where you put these because they're usually less conductive than standard screws. Many cases have detachable motherboard mounting surfaces that make board swapping a breeze. If your case isn't one of these, you'll have a harder time sliding out the motherboard. To remove the standoffs, gently squeeze with needle-nose pliers, or tweezers if you're in a pinch, and push it through the hole.

7 Stipple Your Foundation, Never Smear It

Comb through all the jumper settings on your new motherboard with manual in hand. You should make sure all your settings are correct for the processor you're running, even if the board has been sent fresh from the plant with a CPU attached. Take the SIMMs off the old motherboard and put them on the new one (if they both take the same kind). If you can't use your old SIMMs, take those puppies down to your local computer store and sell them.

8 The Perfect Blush is When You're Hot and Sweaty

Now comes the moment when you slap your CPU into the new motherboard's ZIF socket. It should only fit one way, but if you try hard enough—and bend enough pins—you can fit it any way you want. Depending upon the CPU fan you're installing, you may need to connect this to the CPU before mounting on your motherboard. If you have a COAST (Cache On A STick) socket you'll want to insert your cache now.

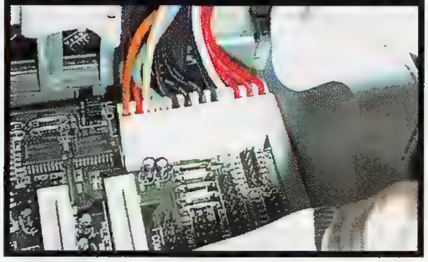


We had to move the screw mounts on the bottom of the case in order to line up with the ⑨ new board.

9 Define Your Lips with a Darker Outline

Match up the screw mounts in the new motherboard with the holes in the bottom of the case. The holes in the motherboard that line up with the slots in the bottom of the case will need plastic standoffs that keep the new board from accidentally touching the computer's chassis and shorting out. Line up the motherboard in the case using the keyboard port as a guide. Remount the board by sliding the ends of the plastic standoffs into the slots on the bottom of the case. Screw it into place.

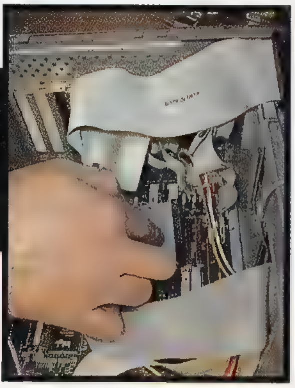
Plugging a split-plug power connector into your ⑪ motherboard backward will scrag it faster than a bug zapper.



⑦ Remember the golden rule of computers: MEMORY=CASH.

10 Smile While Applying Color to Your Cheeks

Reattach the wires for the case buttons and LEDs to the motherboard. Consult your manual if they aren't labeled. Plug the ribbon cables into the IDE and floppy controller on the new motherboard. Make sure to get pin 1 on the cable (look for the stripe on the side of pin 1) to pin 1 on the motherboard, and don't stretch your drive cables too tightly or they *will* unplug themselves later. Connect the new serial and parallel ports to the motherboard as well. Reconnect the drive bay carriage if you had to remove it while getting the old board out. Plug your expansion cards into the new slots.



⑩ Be sure to plug into the primary IDE connection. It offers better access times.

11 Buff Your Skin and Remove Excess Makeup

Reconnect power to the drives and the CPU fan. Be careful when plugging the power supply into the new motherboard. If it's a split plug, you'll want to make sure that they sit black to black, meaning: the black wire from the first connector is next to the black wire from the second. The new single 20-pin Molex connector takes the hassle out of this task because it won't plug in backward. Don't replace the case just yet.

12 Meet the New You

Power up and enter CMOS. Your new BIOS should identify your hardware on boot-up but it's usually a good idea to confirm whether or not it sees things the way you want it to. If it doesn't see the CPU correctly, for example, you'll need to go back in and fiddle with jumper settings on the board. Enter the time and date, save, and exit.

PC GAMER ONLINE

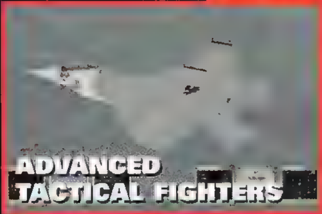
WE'RE YOUR GATEWAY TO

gaming goodness

ON THE INTERNET

we give you...

hot game demos


ADVANCED TACTICAL FIGHTERS

Descent II • Terminal Velocity • Daggerfall • plus many more!

game hints, tips, & cheats

WARCRAFT II

PRIMAL RAGE

MechWarrior II • NASCAR • Mortal Kombat III • and more!

complete reviews index

the highs,
lows, and
scores for
every game
we've rated

PC GAMER
EDITORS'
CHOICE

PLUS...
Your chance
to tell us exactly
what's on your
mind!

http://www.pcgamer.com

news • reviews • previews • forums • chat rooms • links

boot clinic

Ask and ye shall receive

My friend recently gave me a copy of *boot*; I think it's a wonderful magazine and I love your rating system. The only thing that would make it the best PC mag ever would be if you had a problem corner.

Zerokol

Dis or dat

I don't know if you answer this kind of question, but I'll give it a shot. In *boot* 05, you mentioned that Microsoft was releasing OSR2 of Win95. I bought a computer in November of '96 and I'd like to find out if it has OSR1 or OSR2. How do I do that?

Michael Duey

Disc Editor Sean Downey replies: *Bringing up your System Properties will show the version of Win95 you're running. You can do this either by right clicking on My Computer and selecting Properties, or selecting System from the Control Panel. If you're running OSR1, the version number will be 4.00.950, and if you have OSR2 it will be 4.00.950 B. Typing VER at a DOS prompt will also clue you in by listing version 4.00.1111 for OSR2.*

MMX and acceleration

I own a Toshiba Infinia 7200 and was wondering if there will be any way to upgrade my P200 processor to support MMX, without getting a completely new motherboard and processor. Also, I've been reading about people using a 2D accelerator with a 3D card. What special steps must be taken to get these two cards to work together?

Nate Brock

Tech Editor Chris Dunphy replies: *Check your motherboard manual to see if it can provide the 2.8 volts that the MMX CPU requires, if so, just buy the chip, drop it in, change some motherboard jumpers, and you're set. If not, you'll have to wait until Intel releases an MMX overdrive chip that contains the voltage conversion circuitry built in.*

As for using a 3D card in conjunction with your existing 2D... If you buy a 2D/3D accelerator, it'll take the place of your current 2D solution. But, if you buy a 3D-only accelerator, just plug it in, and it should work fine with nearly any 2D chip.

Irreconcilable differences

In all the hype about MMX, one question seems to be overlooked.

From what I've read, it appears that the MMX extensions allow the CPU to more efficiently run the 3D rendering algorithms. These are the same functions that 3D video cards implement.

1) Does it make any sense to have both in the same machine?

2) If you have an MMX machine, why do you need a 3D card? Or does the 3D card handle the software that is not MMX enabled?

3) Can both modes of rendering work at the same time—if so, what is really going on?

Wynn Winkler

Reviews Editor Andrew Sanchez replies: *1) Yes.*

2) Your second answer is the correct one. Until MMX becomes more prolific, many games will be 3D accelerated, whether it's a chipset-specific port or Direct3D. So, if you want to experience 3D acceleration, you'd better choose your accelerator wisely, because MMX does nothing for titles that rely on 3D acceleration. On the other hand, MMX titles will not run if you have just a 3D accelerator. But don't worry, titles that take advantage of both technologies are just around the corner.

3) Future games such as Reality Bytes' Dark Vengeance *will take advantage of both MMX and 3D acceleration. Our guess is that MMX will handle the high-color palette and overall system processing, while 3D acceleration takes care of geometry setup and rendering.*

The truth according to Alan

Everyone should run their computer at 16-bit color, not 8-bit color. The 16-bit depth requires that twice as much data be written to video RAM, but does not require nearly as much computation to deal with (dithering becomes much easier, for instance), and so it doesn't create that much of a performance hit. Since 16-bit color looks much better than 8-bit color, the most important video modes, in terms of speed, are the 16-bit modes.

Alan Robinson

Dip in the road

I have an NEC PowerPlayer 2020 with 48MB of RAM. Can I change my DIP switches and get any more speed? If so, what do I lose in the trade?

Eckhart

Associate Disc Editor Sean Cleveland replies: *The NEC PowerPlayer 2020 contains a 200MHz CPU (3x Multiplier and 66MHz bus speed). Try pushing it to 225MHz first, by setting the Multiplier to 3x and the bus speed to 75MHz. If that doesn't work, try 208MHz (2.5x Multiplier and 83MHz bus speed). You may even want to knock the speed down to 187.5MHz, which will lower the clock speed but will greatly increase the bus speed, giving a boost to your video card and other peripherals (2.5x Multiplier and 75MHz Bus Speed).* ***BE CAREFUL:*** *The silicon core in the CPU can—literally—melt from pushing too hard.*

Putting the disc into DOS

I recently bought my first issue of *boot*. All I can say is that it was worth every penny. But I have a small problem and I hope you can help.

Win95 allows you to boot your computer into DOS, but when I do, I can't access my CD-ROM drive. This bugs me because some DOS-based games require the disc to run. Any help would be greatly appreciated!

Jim Kwan

Disc Editor Sean Downey replies: *There are two things you need in order to use a CD-ROM drive in DOS. One is a device-specific driver loading in your* config.sys *file. The other is* mscdex *loading in your* autoexec.bat. *When you install Win95, it REMs out the* mscdex *line in your* autoexec *and moves it to a file called* dosstart.bat *that lives in your Windows directory. When you choose to restart in DOS mode from the Shut Down window it runs this batch file (giving you access to your CD-ROM drive) before it dumps you to a DOS prompt. Hopefully, your computer came with drivers for your CD-ROM drive on floppy (if not they might be on the web), which you can easily install. You should move the new* mscdex *line the installation program adds to the* dosstart.bat *file so Win95 doesn't complain over the real-mode CD-ROM driver.*

boot CD-ROM

In *boot* 06 you said "We haven't figured out a practical use for [bootable CD-ROMs] yet, but we thought we'd pass it on."

Compaq did ...

I just configured a Deskpro 4000 at my company with one. Power-up, put the disc in, reboot, and the disc boots into an OEM install of WinNT 4.0 workstation. Readers of *boot* could: 1) make bootable backups of their systems (or critical subsets) in case of bad hardware failure or for travel (ie. take your basic system with you when you're away from your Kick-Ass screamer); 2) make bootable "development system" discs for testing new stuff that might munch the normal system.

Kevin S. Green

Flexing 3D muscle

How can I get *MechWarrior 2* into that enhanced mode (This Is Your Mech On Righteous 3D)? We just bought a new Micron P200, 512K cache, 64MB EDO RAM, 12x CD-ROM, and a Diamond Stealth 3D 2000 card (with 4MB of VRAM). You *can't* tell me that this system can only run *MW2* in that mode if I get a card like the one that's advertised on those pages. I have to believe that we have the muscle to do it. So, what do I have to do to get my game looking all dark, textured and cool like that?

David S. Gingras

Tech Editor Chris Dunphy replies: *You have a great system, but no amount of raw horsepower can make up for a bit of dedicated 3D hardware. The S3 ViRGE/VX in your Diamond Stealth 3D 3000 (the 2000 has a regular ViRGE and EDO DRAM, not VRAM) only has fair 3D acceleration. There's a special version of* MW2 *available for the ViRGE; contact Diamond and/or Activision to find out where you can get it. But the ViRGE version will not be anywhere near as fast or pretty as the* MW2 *version for the 3Dfx chip. To turn your system into a really killer gaming system, consider adding a Diamond Monster 3D dedicated 3Dfx accelerator. It comes bundled with a version of* MW2 *that should make you more than satisfied.*

Elbow grease

I'm looking forward to tweaking my CPU using the tips in *boot* 05, but am looking for a better CPU fan first. No one in our neck of the woods has heard of heat-sink compound, so I tried some tune-up grease from the local automotive supply. It's a di-electric, heat-resistant, silicon-based gel that seems to have cooled down my CPU. I don't have any qualitative data to back me up but it sure doesn't feel as hot as it used to.

Can someone help me recover space on a 730MB hard disk that's only giving me 540MB? I recently upgraded to a P166+ and got a deal on the drive, but haven't been able to recover that space on my own.

Bruce Tewnion

News Editor Bryan Del Rizzo replies: *If you're using an older or cut-rate motherboard, it may not support hard drives over 540MB. Check with the manufacturer to see if a BIOS upgrade is possible. If the motherboard is using flash BIOS, you may be able to download a new version. If not, you may have to purchase a new BIOS, or even a new motherboard.*

Send your 12-Step Clinic questions to the Doctor at: clinic@bootnet.com

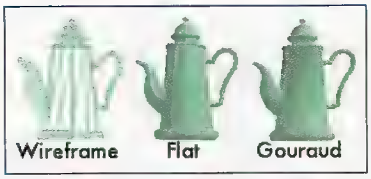
boot white paper

YOUR PERSONAL TECH **BRIEFING** ON THE **CONCEPTS** AND **COMPONENTS** THAT MAKE UP THE **PC** EXPERIENCE

this month: 3D Terminology

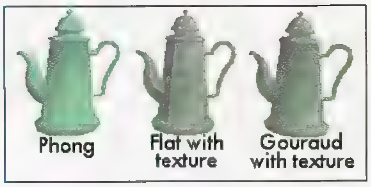
This month we decipher all the mumbo jumbo that litters the spec sheets for the latest must-have upgrade: 3D accelerators. *boot* tells you what the jargon means, and just how important each feature is. From A (antialiasing) to Z (Z-buffering), the terms being thrown around lately by 3D card manufacturers have been dizzying. While we can't make up your mind for you, we can make sure that you know what you are talking about when shopping. (Be sure to check this month's bootWorthy on page 56 for some suggestions about where to start your search.) And even if you decide to hold off on getting a 3D accelerator, this knowledge will come in plenty handy when reading about the newest 3D game engines. Finally, if you have a technical topic you'd like to see broken down and explained in a future White Paper, please drop me a line. In the meantime, dig this 3D jargon decoder and enjoy!

— Chris Dunphy
(cdunphy@bootnet.com)



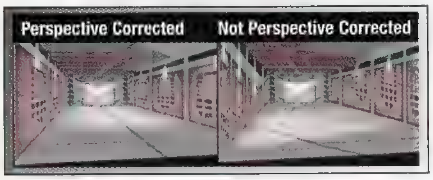
POLYGON

A polygon is simply a flat shape. Typically, most 3D accelerators work with triangles as their basic building blocks, because more complicated shapes can be constructed out of triangles. These triangular polygons are the building blocks of any 3D scene.



FLAT, GOURAUD, AND PHONG SHADING

Once you have a polygon plotted in 3D space, you need to color it in. The simplest way to fill in the polygon with a single color. This is fast, but the result looks flat (hence it is called "flat shading"). Gouraud shading is a mathematical technique used to calculate a gradient and smoothly fill in a polygon with a gradation of color so that it appears darker with distance, or based upon the scene's lighting. Phong shading is similar, but more mathematically complex, and it results in an even smoother, more realistic shading effect. Phong shading is rarely done except with the highest-end hardware.

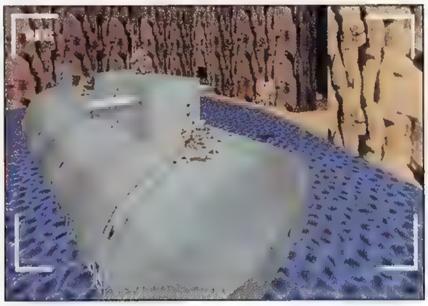


TEXTURE MAPPING

Shaded polygons are still only one color, however. To create impressive scenes that appear realistic and detailed, a bitmap image file can be scaled and mapped onto the polygon. Suddenly, instead of a shaded red plane, you have a brick wall. To differentiate from the dots on the screen, each dot within a texture map is referred to as a "texel" rather than a pixel. Texture mapping has revolutionized 3D gaming.

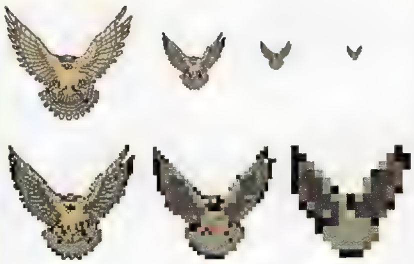
PERSPECTIVE CORRECTION

To make textures mapped onto a polygon look right, the texture map needs to be rotated to match the angle of the polygon. A brick wall where the bricks are not parallel with the ground looks pretty awful. Perspective correction is essential to any 3D accelerator.



ANIMATED TEXTURES

Some 3D engines and accelerators have begun to support animated textures. This allows moving images to be mapped into 3D space onto a polygon, such as an AVI movie playing on a billboard, or dripping slime running down a wall.

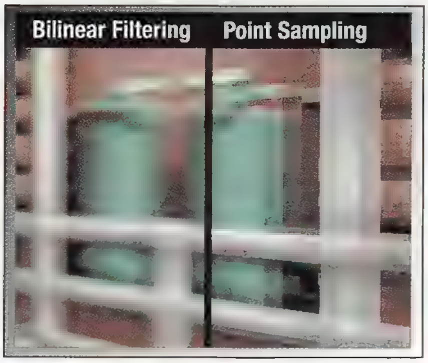


MIP MAPPING

MIP mapping (from the Latin term: Multi In Partem) is an easy way to improve the visual quality of texture mapping while optimizing performance. It works by having multiple texture maps for each texture, each rendered at a different resolution. For example, you may have a 128x128 texture mapped onto a nearby surface, but a 16x16 texture mapped onto that same surface when it's far away. To see this in action, play *Quake* and run toward a wall in the distance. You will notice several jumps in the texture of the wall as you get closer and a higher resolution MIP map is used.

BILINEAR FILTERING

Bilinear filtering uses the four surrounding texels from a texture map to more precisely calculate the value of any given pixel in 3D space. The averaged texels provide a smooth image with antialiased edges (see Antialiasing below). This technique is best seen by standing close to a wall in the 3D-accelerated version of *Quake*. The fuzzy effect looks as it would if you were nearsighted, but is much nicer than the blockiness of no filtering.

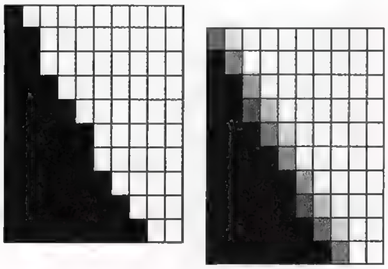


POINT SAMPLING

There's rarely a one-to-one correspondence between the texels in a texture map and the pixels in a polygon they need to fill onscreen. Some sort of mapping is needed to translate the 2D texture map onto the 3D polygon. The simplest technique is called point sampling, which, for every pixel in a polygon on the screen, maps the single nearest texel that corresponds from the texture map. This is the technique used by the Matrox Mystique and Videologic PowerVR. Up close, this technique results in blocky textures.

TRILINEAR FILTERING

One step further up the filtering quality ladder is trilinear filtering, which takes filtering into the third dimension. With trilinear filtering, the resulting pixel is averaged from the four surrounding texels from the two nearest MIP maps. This prevents the texture "shimmering" normally seen as one MIP map replaces another. On the downside, trilinear filtering requires eight memory reads per pixel—compared to four for bilinear filtering and only one for point sampling.

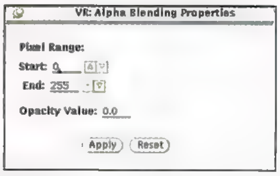


ANTIALIASING

Antialiasing refers to any technique that smoothes the edges of diagonal lines, making them less jaggy. Bi- and tri-linear filtering provide texture antialiasing, naturally smoothing out diagonal lines in a texture map. Some 3D hardware also provides additional antialiasing for smoother edges and joints between polygons.

FOGGING

Fogging is a special case of alpha blending used to create fog effects, so objects seem to disappear into the distant haze. Not only is this a cool-looking effect, but it lets programmers hide the clipping plane so that you don't notice polygons popping up in the distance as you round a corner.



VR: Alpha Blending Properties

Pixel Range:

Start: 0

End: 255

Opacity Value: 0.0

ALPHA BLENDING

Alpha blending allows polygons to be completely or partially transparent. It works by assigning an alpha value to a given pixel, indicating its degree of transparency. This allows for visual effects such as glass windows, and water you can see down into. When you see a screen described as having 32-bit color depth, that usually means that there is a one byte alpha channel for each pixel in addition to the 24 bits of color data. A one byte alpha channel allows for 256 degrees of transparency.

Z-BUFFERING

When rendering a 3D scene, you have to keep track of which polygons are in front of others—it would look bad to have the back of a cube drawn on top of the front. One technique is to use a Z-buffer, an area of memory that represents the screen and is marked with a value for each pixel, indicating the most recent depth rendered into that location. When a new pixel is calculated in a given spot, the 3D engine compares the pixel's Z-value with the current value in the Z-buffer for that location. If the pixel would be behind the already-drawn pixel, it is not drawn. If it is in front, it is drawn and the Z-buffer is updated. The PowerVR and PIX chips use a technique called "display list processing" to avoid the need for a Z-buffer. Instead, they use software tricks to remove polygons that would be hidden in the background, so that there is no need to waste time rendering them, or Z-buffer memory to keep track of pixel depth.

THE 3D PIPELINE AND SETUP ENGINES

The Rendition Vérité is the only 3D accelerator with a full on-chip setup engine. What's that mean? There are two phases to drawing a polygon on the screen: geometry and rendering. In the geometry phase, the CPU plots out the edges of the polygons. Then the traditionally time-consuming phase is the rendering, where the texture mapping, filtering, and filling in of the polygons is done. All of the current 3D accelerators concentrate on the rendering phase, but the setup engine in the Vérité lets it help take the geometry load off the CPU. In the future, expect other accelerators to begin supporting on-chip setup as well.

boot worthy

EACH MONTH, **BOOT** EDITORS GATHER THE BEST **PRODUCTS** IN A SPECIFIC CATEGORY AND DEEM THEM: BOOT**WORTHY**

this month: *3D Accelerators*

If you have been at all awake during the past six months, you couldn't help but feel the heat from the explosion going on in PC games. 3D is in, but without special acceleration hardware you're missing the best part of the newest games. Once you've fragged some cyber demons in accelerated *Quake*, you will never again be awed by the vanilla version. And once you've seen *Tomb Raider*'s Lara rendered in high-res 3D glory, smoothly running and climbing through the caves, you will only be able to laugh at the wimpy PlayStation version. Even a classic such as *Descent 2* suddenly seems new and fresh again. At last, the PC is able to claim the crown from the consoles as the Ultimate Gaming System. These are the bootWorthy cards that will let you do it.

— *Chris Dunphy*

ATI 3D Xpression+ PC2TV

Sure, the ATI Rage II chip doesn't have the eye-popping 3D horsepower of the rest of the cards in this lineup, but it makes up for that by doing something none of the other cards can: your television.

The other cards have earned their place because they deliver absolutely the best 3D gaming experience. The Rage II chip in the 3D Xpression+ PC2TV is not in the same league as the Rendition Vérité or the 3Dfx Voodoo as far as pushing polygons goes. It's comparable to the Matrox Mystique or S3 ViRGE powered cards. It isn't that the Rage II delivers bad 3D performance, it's good. It's just not great.

But good, blown up onto a TV screen, suddenly becomes great! The accelerated version of *MechWarrior 2* that's bundled with the card is an entirely new experience when it's on a big screen in your living room. It's as if your PC was suddenly transformed into a mega PlayStation.

The 3D Xpression+ PC2TV can output any screen resolution up through 800x600 to your television, and it does an admirable job of preserving the image quality and sharpness, despite the low-res nature of an NTSC television signal. It even supports the funky resolutions defined by DirectX for gaming such as 512x384 or 320x400, which other TV-out encoders neglect.

The 3D Xpression+ PC2TV is no slouch with higher resolution either. With 4MB it can do 1280x1024 with 24bit color, nice.

For an additional $129, 3D Xpression+ PC2TV can add a TV tuner/video capture companion card that turns your computer into an inexpensive video editing station. The TV tuner software is very advanced—making transcripts of shows automatically from the closed-captioning information; and scanning channels in the background looking for key phrases (for example, popping up the TV window when "OJ" is mentioned).

***MechWarrior 2* 3D accelerated onto a big screen will make any console system jealous.**

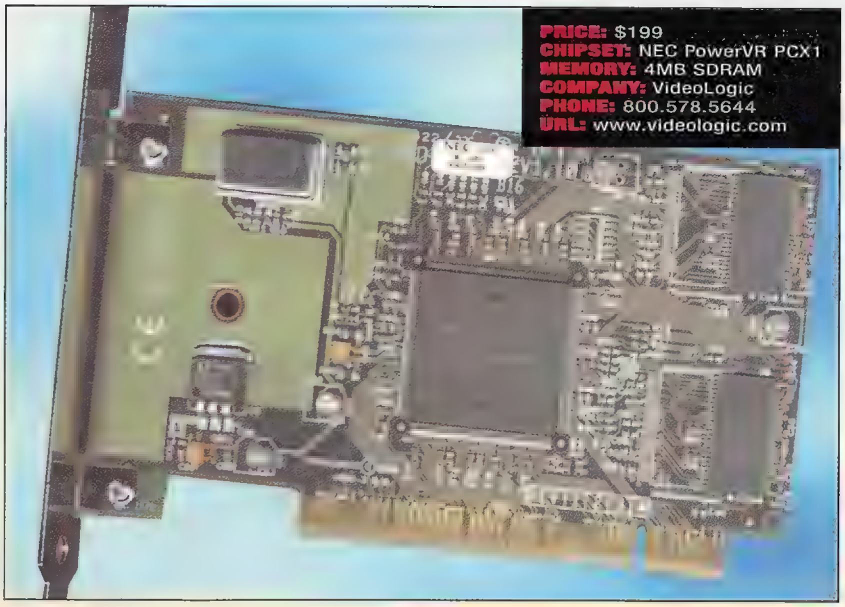
Keep an eye out for the ATI All-In-Wonder card, which should be coming out soon. It combines the 3D Xpression+ PC2TV and this add-on card into a single unit that takes up just one slot, all for about $300.

On top of all this, the 3D Xpression+ PC2TV has the best video playback and scaling we have ever seen. MPEG movies played back full-screen look indistinguishable from VHS; the scaling and colors are smooth and perfect.

So, if you want great 3D, the ATI 3D Xpression+ PC2TV is not for you. But if you need good 3D coupled with a lot of other great features, you can't go wrong with this card. It is most definitely bootWorthy.

PRICE: $219
CHIPSET: ATI Rage II
MEMORY: 4MB EDO DRAM
COMPANY: ATI
PHONE: 905.882.2600
URL: www.atitech.com

Apocalypse 3D

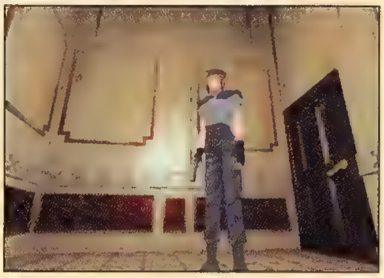


PRICE: $199
CHIPSET: NEC PowerVR PCX1
MEMORY: 4MB SDRAM
COMPANY: VideoLogic
PHONE: 800.578.5644
URL: www.videologic.com

VideoLogic Apocalypse 3D's PowerVR PCX1 chip has a radically different architecture from any of the other 3D cards we've looked at. It suffers a few limitations, but makes up for them with great performance and some special features that none of the other cards can touch.

Like the 3Dfx Voodoo-powered cards, the Apocalypse 3D is a 3D-only card working in conjunction with your current 2D board. Unlike the 3Dfx though, it communicates with your graphics card over the PCI bus, rather than using an external cable to chain onto the VGA port. This allows for the PowerVR to accelerate 3D in a window, and also allows it to work without an onboard frame buffer, using all of its 4MB for texture storage.

The PowerVR does *not* work with polygons as its basic data structure—as do all of the other cards we have seen—instead using a construct called "infinite planes." A triangular polygon to the PowerVR is just an infinite plane in space bordered on three sides by intersections with other infinite planes marking its boundaries. This may sound complicated, but the Direct3D driver software takes care of the dirty work, making this different architecture work transparently. Where it really pays off is in games written specifically for the PowerVR. They can take advantage of special effects that infinite planes allow, such as real-time, pixel-perfect shadows, and light-volume modeling such as the gorgeous headlights shown off in the PowerVR's very cool showcase game, *Ultim@te Race.*

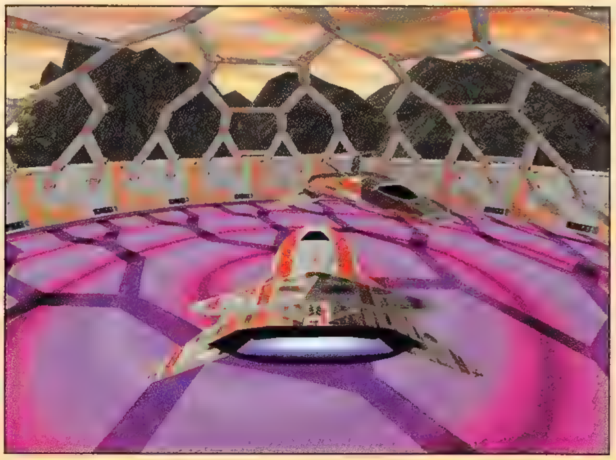


Biohazard **(a.k.a.** ***Resident Evil*****) is coming at last to the PC on the PowerVR. The backgrounds are static, but the 3D-rendered characters look great.**

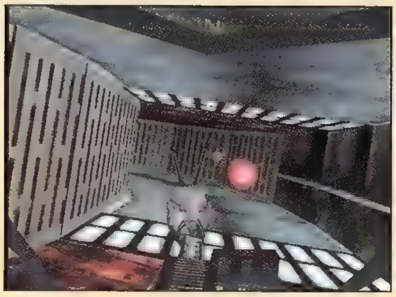
Another thing differentiating the PowerVR is that it does not require a Z-buffer to calculate depth in a 3D scene. The PowerVR chip has an onboard image-synthesis processor that takes in the geometry information for a scene, and outputs for rendering only the foreground pixels—not any that would be obscured by a latter pass. This not only saves on Z-buffer memory, but also helps maintain performance even as scene complexity increases. Because of tricks like this, the PowerVR can play games in 800x600 mode, whereas even 3Dfx-optimized games don't push beyond 640x480.

There is a catch. The current version of the PowerVR chip does not support texture filtering. Being able to devote 4MB to nothing but texture memory allows for lots of high-res textures that help hide the problem, but the lack of filtering does result in a noticeable degradation of image quality compared to the other solutions. NEC and VideoLogic are working on the problem, and will be announcing their PCX2 chip later this year, which adds full filtering support as well as other improvements.

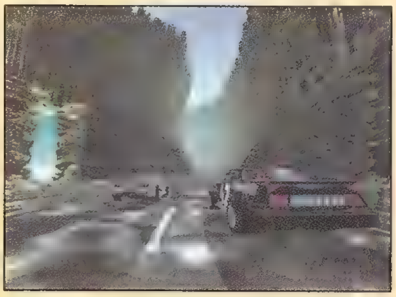
Despite the lack of filtering, the Apocalypse 3D delivers incredible 3D performance, and a lot of games are being optimized to take advantage of the special features that only the PowerVR can provide.



This PowerVR demo shows off the real-time shadowing effects.



Teracide **is another gorgeous game coming out soon for the PowerVR card.**



Ultim@te Race **is pretty, and fast. But you'll need one hell of a Pentium to keep the frame rate up at the maximum quality setting.**

Canopus Total 3D

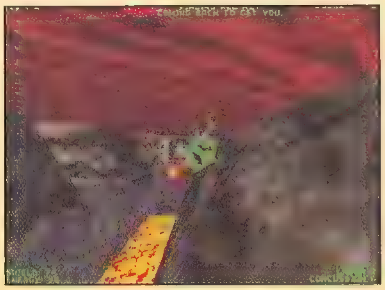
PRICE: $299 / $279 (street)
CHIPSET: Rendition Vérité
MEMORY: 4MB EDO DRAM
COMPANY: Canopus
PHONE: 800.649.9800
URL: www.canopuscorp.com

The Rendition Vérité is the current reigning king of combination 2D/3D chips, and the Canopus Total 3D is the reigning king among Rendition Vérité-based cards.

Unlike most 3D chips, the Rendition Vérité is actually a specially optimized RISC processor assisted by some hard-coded 3D-rendering hardware. This allows for new drivers to reprogram the Vérité to continue offering improved performance as the drivers are refined. The RISC core of the Vérité can also act as a geometry setup engine. So, unlike any other current 3D card, the Vérité not only accelerates 3D rendering, it takes the geometry calculation load off the host CPU.

The Canopus Total 3D uses a special low-power 3.3V version of the Vérité chip, which can be clocked slightly faster than the other Vérité-powered cards. Also, Canopus has spent a lot of time optimizing the 2D Windows drivers, making the Total 3D into not only an excellent gaming card, but a great productivity solution as well.

The Total 3D enhances your hearing as well as your vision. You can wire the output of your sound card into the back of the Total 3D where a Spatializer sound chip broadens and enhances stereo separation.



***Descent II* is not only 3D accelerated on the total 3D, you can also use the stereoscopic glasses for real sense of depth.**

The Total 3D also has a jack for hooking up the LCD shutter glasses that are included in the bundle. When playing games that support the glasses, such as the bundled version of *Descent 2*, the effect can be startling. Once your eyes adjust, the enemies seem to hover in space in front of the screen.

The other Vérité-based cards from Intergraph, Sierra, and Creative Labs all cost less than the Total 3D and are all solid performers.

The Sierra Screamin' 3D, in particular, is worth a look. It was designed for Sierra by Canopus and features the best software bundle, and great Windows drivers that almost match the Total 3D. But, as far as being bootWorthy is concerned, the Canopus Total 3D is the best of the bunch, and it has earned this place of honor.

To Filter or Not to Filter?

Every 3D accelerator has its own strengths and weaknesses. Some compromise effects to eke out more performance; others run so slow that we can only wish they would have cut an effect or 10.

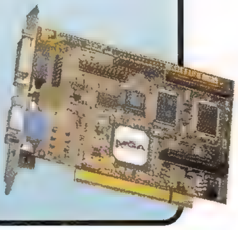
The most notorious compromise is Matrox's decision to leave filtering and fogging off the Mystique card in order to pump up the speed. More recently, the PowerVR, from NEC and VideoLogic, omitted filtering as well. Are these fatal flaws, or just different strokes for different folks?

More than any other enhancement, bilinear filtering makes 3D-accelerated *Quake* such a feast for the eyes. Games such as *Tomb Raider* and *Quake* tend to push walls right up in your face, and the filtering is essential to make them look good.

But wide open racing games, such as *Ultim@te Race* for the PowerVR, don't deal with a lot of up-close walls. These games thrive on sheer polygon speed, and the PowerVR delivers—with enough horsepower to run *Ultim@te Race* in 800x600 resolution.

Games written to use high-res textures suffer less from the lack of filtering. Matrox's Mystique can indeed pump serious polygons with its specially optimized version of *Destruction Derby 2*. The high-res textures add detail, so things look genuinely better up-close, not just blurred. But it remains to be seen how many game developers will be taking the special limitations of specialty cards into consideration when writing their games.

With 4MB of dedicated texture memory, the PowerVR is a lot more likely than the Mystique to benefit from high-res textures to overcome its lack of filtering. That, combined with its otherwise spectacular performance, makes it a serious contender. The Mystique, however, lacks the redeeming qualities necessary to make up for its lack of filtering and fogging.



Orchid Righteous 3D / Diamond Monster 3D

This bootWorthy designation is shared by two nearly identical cards, both based on the excellent Voodoo chipset from 3Dfx. The Voodoo has established itself as the "ultimate" in 3D acceleration, and these cards deliver.

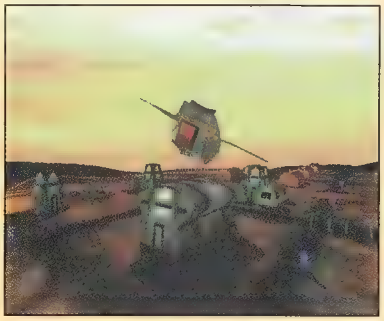
The Voodoo is a 3D-only accelerator and it must work in conjunction with your current 2D card (or 2D/3D card). Connect both your monitor and the output from your VGA card into the back of the Voodoo and you're off! This VGA chaining arrangement does have a downside—to run, the Voodoo must take over the screen entirely, blocking the output from the 2D card. Therefore, it only accelerates games that run in full-screen mode, and it doesn't do anything to speed up 3D in a window, such as a VRML browser.

The Voodoo splits its memory into a 2MB bank of textures and a 2MB frame buffer, each on a separate memory bus. This parallel processing allows the Voodoo to achieve its incomparable texture mapping speed.

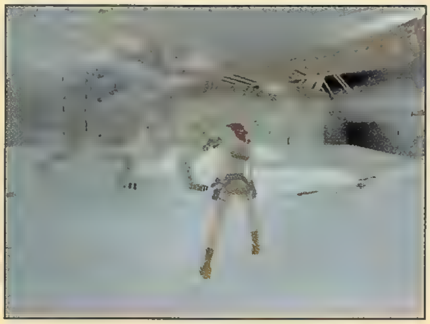
The Diamond Monster 3D's software bundle is slightly larger, but Orchid has a slight lead in tuning and optimizing their drivers. The truth is: You can't go wrong with either of these cards if you're looking for the ultimate 3D experience. If the lack of 3D in a window bothers you, be on the lookout for new cards based on the Voodoo Rush chipset. This chipset modifies the Voodoo so that it can share a card slot and a frame buffer with a traditional 2D-only chip. By working together, they get over the limitations of the original Voodoo, becoming a 2D/3D card rather than 3D only. Look for Voodoo Rush boards later this year.

Given the quantity and diversity of accelerated software available for the 3Dfx, and the chip's awesome performance, either of these cards is guaranteed to impress.

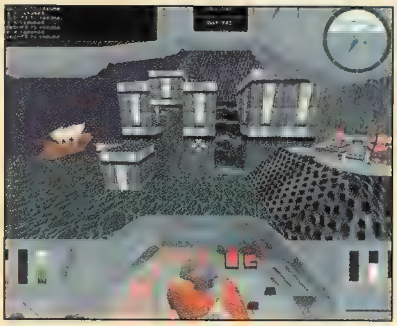
PRICE: $299 / $299
CHIPSET: 3Dfx Voodoo
MEMORY: 4MB EDO DRAM
COMPANY: Orchid / Diamond
PHONE: 888.545.5733 / 800.468.5846
URL: www.orchid.com
www.diamondmm.com



Accelerated *Scorched Planet* looks so much better that the vanilla version will hurt your eyes.



Step aside PlayStation... *Tomb Raider* looks incomparably good on the 3Dfx.

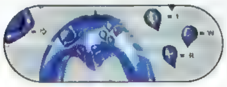


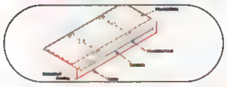
Hellbender is actually playably fast on a 3Dfx chip, and it looks good too.

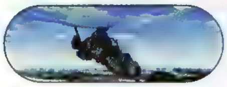
H/w

boot previews

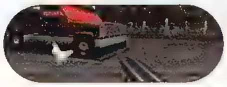
HARDWARE ON THE HORIZON AND **SOFTWARE** SOON TO SHIP


60 **USB** Peripherals


62 **Klamath**


63 **Voxel** Space 2

64 Dark **Vengeance**


65 **Redneck** Rampage

The boot Tracking Sheet

TITLE	DEVELOPER	DATE
Armored Fist 2	NovaLogic	4/97
Dungeon Keeper	Bullfrog	4/97
Jedi Knight: Dark Forces 2	LucasArts	4/97
Redneck Rampage	Interplay	4/97
Sierra Pro Pilot	Sierra	4/97
Creation	Bullfrog	5/97
Hexen 2	id/Raven	5/97
The Curse Of Monkey Island	id	6/97
Flight Unlimited II	LookingGlass Technologies	6/97
Grand Prix Legends	Papyrus	6/97
Shadow Warrior	3DRealms	6/97
Crusader III	Origin	9/97
The Dark Project	LookingGlass Technologies	12/97
Mask Of Eternity	Sierra	12/97
10th Planet	Bethesda	12/97
Ultima IX	Origin	12/97
Prey	3DRealms	3/98
Indestructables	Bullfrog	on hold
Quake/Direct3D	id	DEAD
Bioforge II	Origin	DEAD

* These dates are subject to change

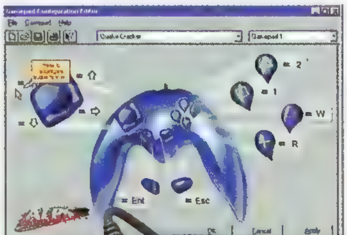
Exclusive Look at the First USB Peripherals

Premiere products show promise

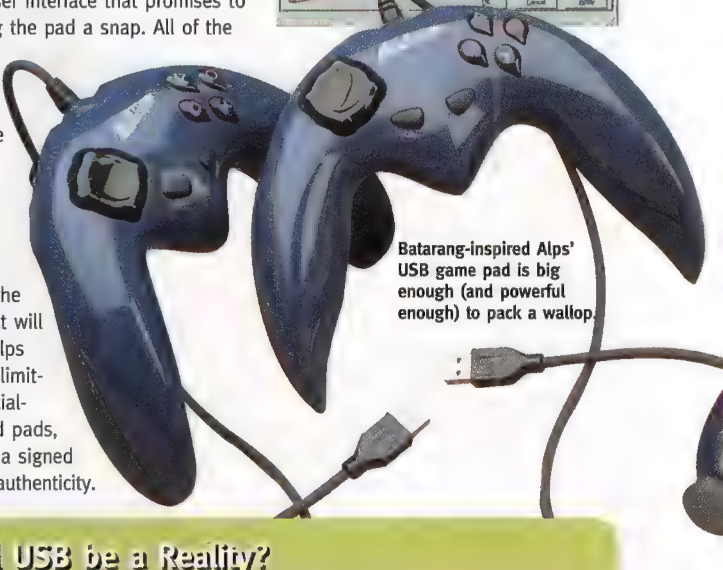
Universal Serial Bus (USB) is a powerful new connectivity standard for the PC, and after months of waiting and rumors of vaporware, boot has snagged an exclusive look at the first four USB peripherals expected to hit the shelves. These should become available in the first half of 1997.

— Bryan Del Rizzo

Alps Game Pad



The first thing you'll notice about the game pad is its unique design. This is the largest pad we've ever seen, but the contoured design, and rubber grips should be comfortable for smaller hands, too. The game pad sports 10 buttons and a directional pad, and will ship with a Win95 graphical user interface that promises to make programming the pad a snap. All of the buttons (including the directional pad) can be programmed for single keystrokes, or macros, and you'll be able to assign functions for any button press and release. Although the initial retail product will be metallic blue, Alps plans to release a limited number of special-edition metallic red pads, that will ship with a signed number indicating authenticity.



Batarang-inspired Alps' USB game pad is big enough (and powerful enough) to pack a wallop.

When Will USB be a Reality?

Delays in developing the drivers and hardware design implementations have pushed USB's original release date back by almost a year. While many companies have announced plans to introduce USB devices, few have actually been able to develop solid, working drivers. And since Microsoft has decided to implement USB support in Memphis (a subsequent version of Win95 slated for release this summer), current PCs with older versions of the operating system won't be compatible with the new software model.

So, even if you purchased a new USB device, chances are it won't work with your current system. The only way around this problem is to purchase a new PC with OSR/2 preinstalled—not exactly a cost-effective or viable solution for most consumers.

Still, since USB isn't expected to hit mainstream until early 1998, this year should prove to be a testing ground for both PC and USB peripheral manufacturers. By '98, broad industry support from software developers, hardware manufacturers, and PC BIOS makers should help reduce the consumer anxiety, confusion, and frustration associated with this new connectivity standard.

Alps' USB keyboard pumps 12MB/sec for those e-mails to Evelyn Woods.

Alps Keyboard

Alps' USB keyboard will look and feel the same as their regular keyboard. From the typist's perspective, there's really no performance advantage in using a USB keyboard, unless you can type faster than 12MB/sec. (A regular run-of-the-mill keyboard has a transfer rate of 115K/sec.) The real advantage of a USB keyboard will be simplicity and expandability. At press time, Alps hadn't announced a USB version of their GlidePoint keyboard (reviewed in *boot* 06), but they haven't ruled out the possibility.

Alps Hub

Because most PCs will ship with only two USB ports, Alps' hub will allow multiple USB peripherals to be connected to your PC at one time. The current hub allows four independent peripherals to be connected to one port, so if you want to connect two game pads, a keyboard, and a joystick, the hub will be your only solution (until PC manufacturers completely abandon all other forms of connectivity such as the serial port and parallel port). The hub resembles a small pair of binoculars; is equipped with little feet (so you'll be able to stand it up or lay it down); and is designed to sit on your desk, so you won't have to hassle with plugging in cables to the back of your PC.

ThrustMaster Top Gun Joystick

ThrustMaster also plans to release USB devices this year. One of the first is a USB version of their new Top Gun joystick (see review on page 91). Functionally, the USB stick will be the same as the original, but operation and performance will be enhanced due to the fat USB data transfer rate.

The hub by Alps will tap USB promises of peripheral mania.

TOP GUN
THRUSTMASTER

ThrustMaster has ported their Top Gun joystick to the USB standard.

product info

PRODUCT: Game pad, keyboard, hub
AVAILABLE: mid-97 to retail
PRICE: TBD
COMPANY: Alps Interactive
PHONE: 800.950.2577
URL: www.interactive.alps.com

product info

PRODUCT: Top Gun
AVAILABLE: mid-97
COMPANY: ThrustMaster
PRICE: TBD
PHONE: 503.615.3200
URL: www.thrustmaster.com

Alps Speaks Out on USB

Alps Interactive may not be a household name yet, but that may soon change. We spoke to Ken Kajikawa at Alps Interactive, about the advantages of USB, and how it will affect the PC.

boot: Why is Alps embracing USB?

Kajikawa: Power! USB is 100 times faster and more flexible than anything we've ever had available for gaming products (and for other kinds of input devices for that matter). Today's hot gaming systems are becoming notorious for running out of IRQs before the customer ever opens the box. Computer makers are aggressively looking forward to taking all the extra junk out of the PC. When that day comes, a PC with one PCI peripheral—the USB controller—will drop a lot of slow, clumsy, ISA peripheral baggage from the last 15 years.

boot: How will USB affect game playing?

Kajikawa: Speed! and lots of it. The old-style game ports we all have were designed in 1980 or so, more than 15 years ago. The system must get data from the game by interrupting the game roughly 10 percent of the time. This number does not change whether you have an old 486 or a sizzling Pentium Pro. Digital joysticks pare this down somewhat, but you're still not free of the 10 percent deficit until you get off the old connector. With USB, gameplay will be smoother and cleaner across the board.

boot: Will USB peripherals still require special drivers like the ones for Win95 and DirectInput?

Kajikawa: Another USB advantage is that we will soon see games that have been written to be independent of the joystick or game pad. USB devices are self-describing—the game can literally ask the game pad how many buttons it has, how many POV hats, etc. Developers will find this handy because it will allow them to focus less on input devices and more on creating better content through enhanced gameplay control and versatility.

boot: How does the USB hub work?

Kajikawa: When you plug a new device into a USB hub, the hub detects the change, but it does not enable the new device yet. Instead, it gives the PC the chance to decide if it can handle another device.

For example, if you have a USB camera, a USB ISDN phone, and a couple of USB game pads plugged in, you may find that the PC will refuse to connect your new USB printer/scanner—at least until you hang up the USB phone and free-up that bandwidth. USB is pretty smart about trying to give you the most usage for your 12Mbps. After the PC decides that everything's OK, it alerts the hub to enable the device. Then the PC (using Plug and Play) loads the drivers for the new device, and away you go.

boot: What's the expected data rate with multiple peripherals?

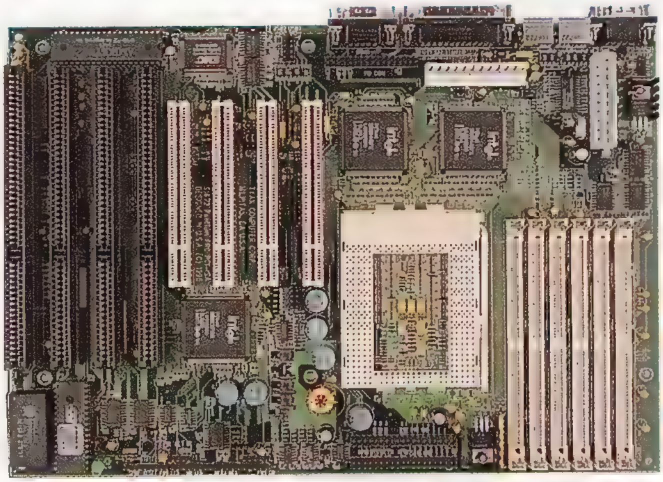
Kajikawa: It depends on the peripheral. Low speed (1.5Mbps USB devices) can effectively run at 64Kbps. If anything else is attached besides the gaming devices, your mileage may vary. In general, though, gaming devices will be far faster than required.

H/W

Klamath

Intel's next CPU unifies MMX and the Pentium Pro

Can't decide between the multimedia flash of MMX and the sheer power of the Pentium Pro? Well, your dilemma may be over. Intel is combining the best of both worlds in their premiere P6 offering known as "Klamath."

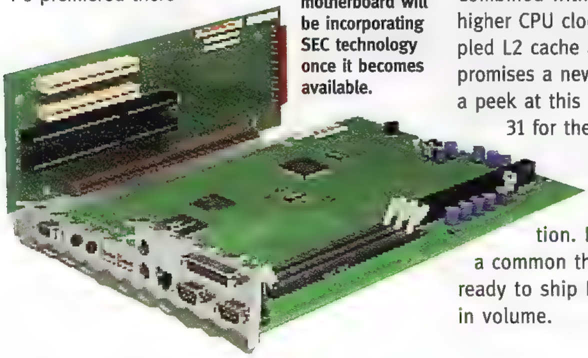

For Tyan, making the move from Zero Insertion Force (shown here) to Single Edge Contact will be quick and painless.

Originally slated for introduction in March/April '97, the next generation CPU has slipped but should still start shipping to OEMs before midyear. Manufacturers are looking to present their first Klamath-powered systems for the fall refresh, but many have confided that they will be lucky to have P6 product on the shelves for the holiday shopping season.

Competition for that shelf space will be stiff, with Klamath battling the MMX-enhanced Pentiums announced at the start of '97, Pentium Pros that are just now starting to hit the consumer outlets in volume, and even vanilla Pentiums of the high-speed variety.

While Klamath will vie with a confusing flurry of its Intel brethren for popularity, the P6 processor has a lot to distinguish it from the pack. With anticipated speeds of 233MHz and 266MHz, combined with 32K of on-chip cache, Intel expects 10 percent to 15 percent performance gains over their current top performers. According to an Advance Program Sheet from the IEEE International Solid State Circuit Convention held in San Francisco in February, the P6 premiered there will run at 300MHz and employ 7.5 million transistors. Current Pentiums max out at 200MHz with 5.5 million transistors. When pressed for exact specifications for Klamath, Intel's Manny Vera would only say, "Expect Klamath to be faster than today's P-Pro and Pentium processors."

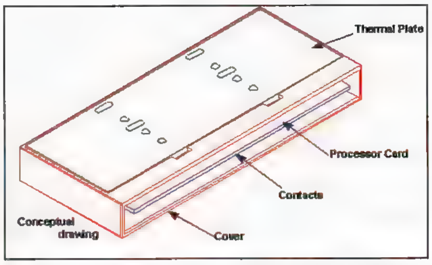
"Expect Klamath to be faster than today's P-Pro and Pentium processors."


Intel's new NLX form-factor motherboard will be incorporating SEC technology once it becomes available.

Another breakthrough will be the Single Edge Contact (SEC) cartridge that Intel will introduce with Klamath. This technology will migrate the CPU and its external cache from the ZIF socket directly on the motherboard to a new daughterboard configuration.

While the notion of mounting a CPU onto a daughterboard isn't new (Apple and Amiga have both tried it), Intel will make this dramatic move to fulfill some important current *and* future needs. "The beauty of this packaging," says Vera, "is that it allows us the flexibility to offer different cache sizes over time." Combined with its enhanced ability to handle higher CPU clock speeds and the closely coupled L2 cache architecture, SEC technology promises a new standard in CPU design (take a peek at this month's *Fast Forward* on page 31 for the complete lowdown).

Most major manufacturers we have spoken to are priming themselves for the SEC evolution. But no matter who you talk to, a common thread emerges—they will be ready to ship Klamath when Intel ships chips in volume.



Conceptual art for Intel's Single Edge Contact cartridge.

Intel is optimistic about manufacturers making the change. "The basic difference," says Vera, "will be that instead of a square socket, the motherboards will have a slot. Other than that, they're basically the same, which means [manufacturers] can modify their current ATX and LPX motherboards to handle Klamath."

And Intel will not be the only show in town (at least when it comes to motherboards). Many companies have motherboards with SEC slots planned for shipping. "Since Klamath is scheduled to ship in the first half [of '97]," says Vera, "expect these motherboards to ship a couple of months before that." Indeed, many motherboard manufacturers are already priming their newest creations for public consumption.

Tyan's SEC-compatible motherboard, the Tahoe S1682D, will also take advantage of Intel's Natoma 440FX PCIset chipset and should be available by the time you read this. It'll ship with *two* Slot One connectors, and will be armed to the teeth with eight 72-pin SIMM slots, three ISA, and five bus-mastered PCI slots (one shared).

If you decide to forego these new systems, and go the upgrade route, prepare to abandon your motherboard. Klamath will *not* be compatible with any socket-8 boards. For those with an MMX-compatible motherboard, and a lot of patience, an OverDrive chip will be available sometime in early 1998.

— Andrew Sanchez

product info

PRODUCT: Tyan Tahoe S1682D
AVAILABLE: jan 97
PRICE: TBA
COMPANY: Tyan
PHONE: 408.956.8000
URL: www.tyan.com

product info

PRODUCT: Intel Klamath
AVAILABLE: Q2 97
PRICE: TBA
COMPANY: Intel
PHONE: 800.628.8686
URL: www.intel.com

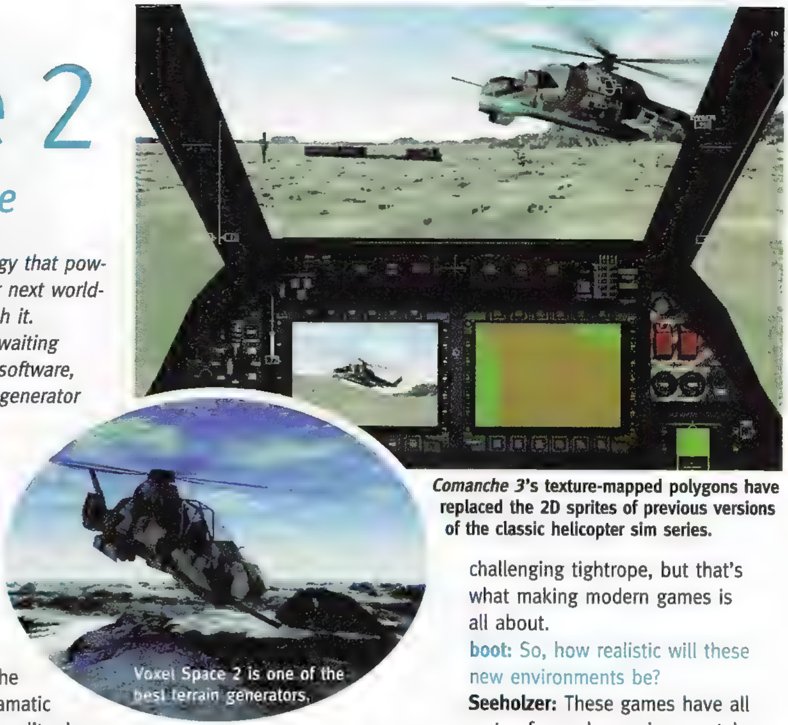
S/W

Voxel Space 2

NovaLogic pumps up the volume

NovaLogic, creators of the revolutionary Voxel Space technology that powered the original Comanche *games, has been working on their next world-stomping terrain generator, and they're nearly ready to unleash it.*

With their awe-inspiring Comanche 3 *and* Armored Fist 2 *awaiting release, we had a chance to catch up with NovaLogic's VP of software,* ***David Seeholzer****, to ask him why Voxel Space 2 is the terrain generator you should care about.*



Comanche 3's texture-mapped polygons have replaced the 2D sprites of previous versions of the classic helicopter sim series.

Voxel Space 2 is one of the best terrain generators.

boot: What improvements does Voxel Space 2 have over the original Voxel graphics engine?

Seeholzer: For one, the terrains in Voxel Space 2 are much larger, addressing one of the limitations of the original. In addition, VS 2 allows far greater detail when you get close to the ground: mountainsides and river beds look detailed and tactile up close. On top of all this, there's a sophisticated system supporting roads, runways, footpaths, and other delineated areas.

boot: Will all the objects in *Comanche 3* and *Armored Fist 2* be texture-mapped polygons or will there be 2D sprite-based objects as well?

Seeholzer: *Comanche 3* and *Armored Fist 2* are entirely 3D games. All the elements are texture-mapped polygons. Our polygon rendering engine goes well beyond traditional Gouraud shading to include light sourcing and translucency; both games also contain some of the most highly detailed and accurately articulated real-time geometry ever seen.

boot: Will Voxel Space 2 support 3D graphics accelerators? What about MMX?

Seeholzer: We're still investigating both. 3D hardware acceleration has certain negatives, the most significant is a dramatic decrease in the object quality due to software techniques not supported in hardware. On the other hand, *our* engine is 100 percent, highly-optimized, assembly language, so hardware accelerators don't offer us much faster frame rates.

And while certain parts of our programs can be enhanced through MMX instructions, until there's an installed base, it's premature to speculate on the benefits.

boot: Will *Comanche 3* appeal to the hardcore flight sim addicts who scoffed at previous NovaLogic titles for their lack of realism?

Seeholzer: For hardcore enthusiasts, there is nothing more satisfying than a 100 percent accurate sim; however, real life is never as much fun or as exciting as we'd like it to be. There's always a need to compensate for the sake of fun. We have a good understanding of what makes games fun, and we think that we can make our products more faithful to reality without abandoning the fun element.

Comanche 3 is a prime example. We made the flight model and the armament as accurate as possible. However, there *are* places where we depart from reality, when it dramatically enhances the game. This is a challenging tightrope, but that's what making modern games is all about.

boot: So, how realistic will these new environments be?

Seeholzer: These games have all sorts of complex environmental elements that go far beyond anything we've ever done before. This ranges from enemies who can communicate with other enemies to chain-reaction events.

boot: Beyond the new looks, how will the new games sound?

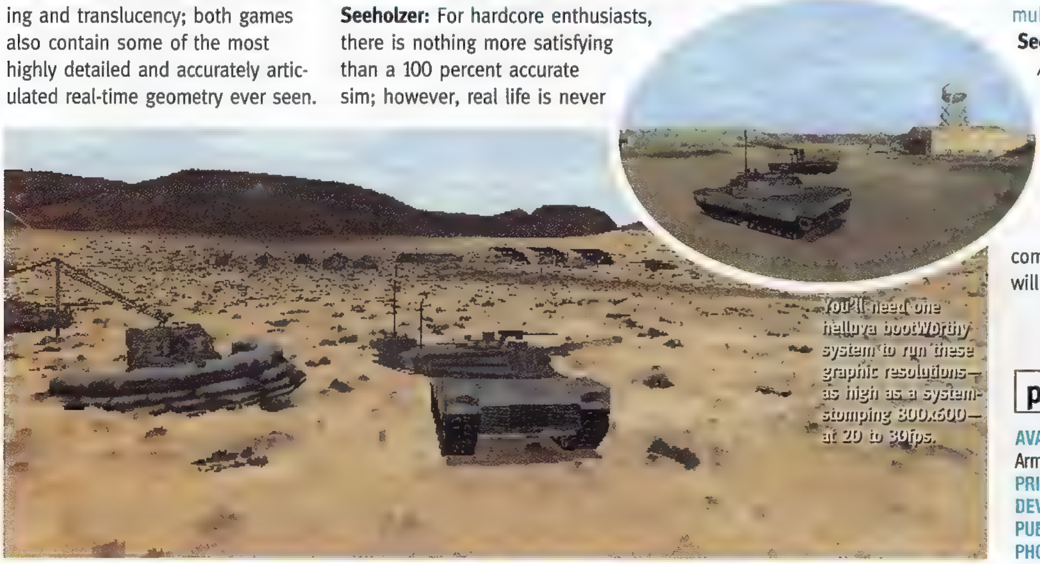
Seeholzer: We're using a mix of digital music and General MIDI. We use GM for music, occasionally enhancing it with digital audio. The music is interactive, with complex adjustments and changes that occur in time with the action.

boot: Will the new games have multiplayer options?

Seeholzer: *Comanche 3* and *Armored Fist 2* are both multiplayer ready, straight out of the box. Both allow you to play missions with up to seven additional people with the purchase of only one box.

We're working hard on Internet compatibility, and both products will work with *Kali*.

— Andrew Sanchez



You'll need one helluva bootWorthy system to run these graphic resolutions—as high as a system-stomping 800x600—at 20 to 30fps.

With *Armored Fist 2*, NovaLogic has upped the ante on creating breathtakingly immersive worlds at resolutions up to 800x600.

product info

AVAILABLE: Comanche 3 in march 97; Armored Fist 2 in april 97
PRICE: TBA
DEVELOPER: NovaLogic
PUBLISHER: NovaLogic
PHONE: 800.858.1322
URL: www.novalogic.com

Dark Vengeance

Feel the wrath

Tired of running around caves with the occasional bat or wolf? Reality Bytes' Dark Vengeance *is just what you need. A polygon lover's paradise,* Dark Vengeance *utilizes almost every new PC gaming technology and is sure to turn more than a few heads.*

boot *talked to the folks at Reality Bytes about their upcoming game.*

Cold steel meets warm flesh in *Dark Vengeance*.

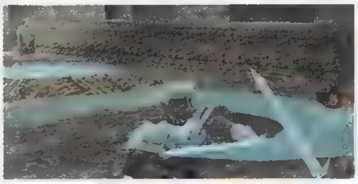
boot: What exactly is *Dark Vengeance*?

Jon Chait, President and CEO: Intense is the only way to describe it, from the characters to the gruesome effects to the environments. *Dark Vengeance* is a true 3D action game set in a fantastic, fully interactive and fully immersive fantasy world.

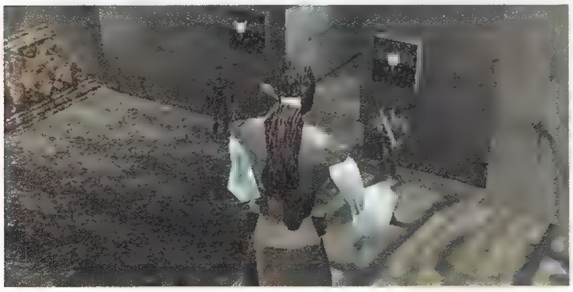
boot: Will any 2D sprites sneak into *Dark Vengeance*'s 3D world?

David Chait, VP of Product Design: Our goal is to use 3D for everything. The environment, characters, projectiles, and special effects are all 3D. But, we're realistic: certain special effects may just look better with animated sprites, not to mention that slower machines may require sprites for better performance.

Jason Davis, VP of Research and Development: *Dark Vengeance* is able to leap into the next generation of 3D, polygon-based games by utilizing our proprietary RIVET engine, and editor, Leonardo. Our characters weigh in at around 500 to 600 texture-mapped polygons and some monsters will push as many as 700 polygons. We've worked hard to build an engine that surpasses the performance of the *Quakes*, the *Unreals*, and the *Preys*.


Battle unholy minions within a gorgeously texture-mapped universe.

Because we've put so much effort into our engine, we don't have to cut corners by using lots of sprites and cheats to create the illusion of 3D. We're able to take the immersiveness of 3D environments to the next level by offering interactive indoor and outdoor environments, freeing gamers from the confines of stuffy dungeons.


Two guards? No problem! Choose from a variety of characters in your quest to destroy the growing darkness.

David Chait: The "smart" camera allows the gamer to witness all of the action, ensuring that nothing is missed; pans, cuts, swipes, and a number of other dramatic film techniques guarantee the best view in the house. By offering third-person, instead of standard *Doom*-style, gamers will see themselves interact with the *DV* world. Combat isn't limited to guns and projectile weapons, and gamers will witness all of the close combat action, intricate spell-casting motions, climbing, and jumping just as it happens.

boot: What hardware technologies will *DV* utilize?

Jon Chait: Unlike games which port 3D features into already-shipping products, *DV* is being designed with these in mind, ensuring that the game's graphics and effects are the absolute cutting edge of 3D technology. We're using transparency and fog effects, radial and dynamic lighting, texture filtering, mip mapping, and Z-buffering in order to intensify the gamer's experience.

David Chait: For instance, the look and feel of all of the magic spells in the game is greatly enhanced with 3D acceleration. And, because we work closely with most of the leading chip and board vendors, we are able to exploit their technology to the fullest. Also, the 3D chips were not all created equal and some support features that others do not, so we are careful to identify which special effects may be used in each specific case.

Dark Vengeance takes advantage of Direct3D in order to meet the needs of the majority of gamers. However, where *DV can* get better performance while writing to a specific chipset, it will.

Jason Davis: *DV* is also MMX accelerated. Under MMX, we have a 24-bit software renderer that creates amazing graphic effects, even if 3D hardware is not available. If a 3D accelerator is used with MMX, *DV* will also increase the complexity of character actions and animations.

boot: *Dark Vengeance* will inevitably be compared to Eidos' *Tomb Raider*. What sets *Dark Vengeance* apart?

Jon Chait: Granted, the third-person perspective will inspire some comparison. But the fantasy theme of *DV* creates an entirely different game. Lara may fight off big, bad wolves and teddy bears, but in *DV* you'll battle brutal spider warriors, fearsome dark elves, and hell-spawned beasties that our imaginations haven't even come close to picturing. Zombies have the ability to reach into your chest and pull out your heart. And you can chop off your enemy's head.

David Chait: Another feature that sets *DV* apart is the structure and organization of the game. The player is called upon to complete more than 20 missions as the complex plot unfolds. However, within this loose linear structure, the gamer is presented with a fully nonlinear world to explore. Unlike *Tomb Raider*, which leads gamers through a prescribed order of levels and worlds, the interactive world of *DV* provides a framework for players, but doesn't chain them to any one path. *Dark Vengeance* is a total world, not just a series of levels. The gamer becomes part of that world, is totally immersed, and is therefore at the mercy of the brutal enemies.

boot: How many characters will you be able to choose from?

Reginald Dujour, Creative Director: The gamer will be able to select a character from 10 distinct choices (and each and every one of our female characters could beat Lara into the ground). Each character's distinct capabilities (i.e., weapon and spell usage) make replay a requirement. And as the gamer works his or her way through, their character grows and evolves with them, ultimately becoming an accurate reflection of their personality.

boot: What multiplayer options will *DV* have?

David Chait: *DV* will offer groundbreaking support for up to 32 players across a LAN. Gamers can take on friends in vicious Deathmatches as they roam through the 3D worlds, or team up against mutual enemies in exciting collaborative quests tailored specifically for multiplayer action. *DV*'s "gameserver" code is optimized for sites such as TEN and Mplayer. In addition, the TCP/IP code is also optimized to offer Internet play.

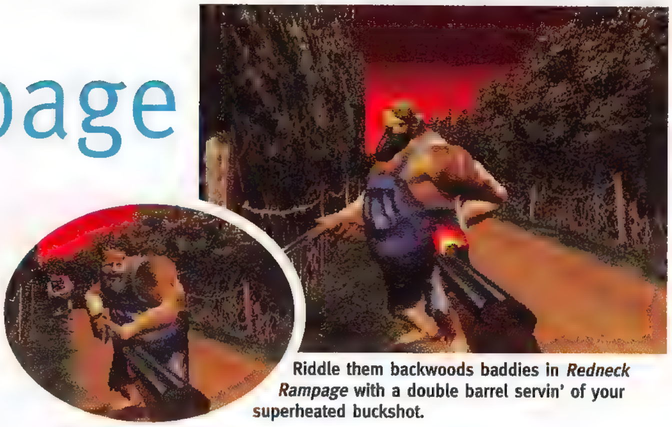
— Andrew Sanchez

product info

AVAILABLE: dec 97
PRICE: TBA
COMPANY: Reality Bytes
PHONE: 617.621.2500
URL: www.realbytes.com

Redneck Rampage

Meet Duke Nukem's inbred cousin



Riddle them backwoods baddies in *Redneck Rampage* with a double barrel servin' of your superheated buckshot.

Grab your double-barreled shotgun and get ready to crack some hillbilly cranium.

Meet Redneck Rampage, *Duke Nukem's half-crazed, inbred cousin.*

With Apogee's BUILD *engine as a foundation, Xatrix Entertainment producer,* ***Drew Markham****, plans to rock and shock your first-person action world with the hilariously violent story of brothers Leonard and Bubba in their quest to save Bessie, their pet porker.*

Redneck Rampage *boasts enough blood and profanity to make* Duke Nukem *seem like a Sunday picnic. Markham tells us why he and Interplay decided to unleash those darned rednecks.*

boot: What have you done with Apogee's *BUILD* engine to ward off the advances of *true* polygon-based games such as *Quake* and *Unreal*?

Markham: We're hoping that *Redneck Rampage* will be so compelling that the game engine will be the last thing on your mind. If you have time to stop and question the technology, then we haven't done our jobs as game designers.

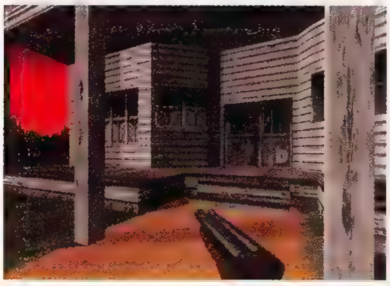
But, since you asked, the innovations include multiple areas within *Redneck Rampage* that are physically built on top of each other. In some cases, there are areas where three to four rooms (e.g. the mortuary) are stacked up. As you know, this can get tricky in a 2-1/2D extrusion engine, especially when the rooms have windows and there are spots where you can physically see into two levels simultaneously.

We have also added true 3D geometry to *Redneck Rampage.* Don't expect to see entire levels made up of this new trick, as it's expensive in terms of frame rate. But we *have* added bridges that can be traversed over and underneath, as well as tables, desks, and staircases throughout the game.

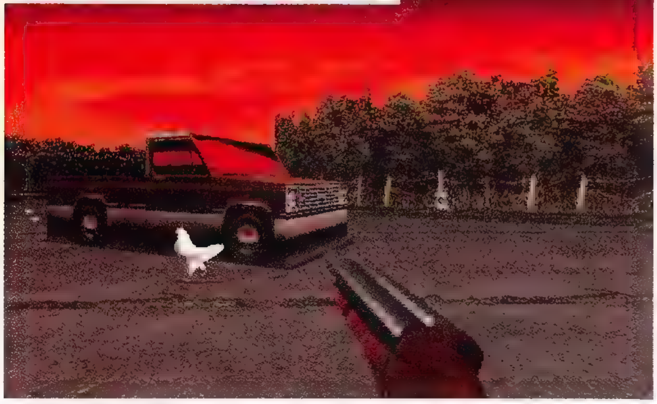
boot: How big will the worlds be? How many levels?

Markham: Right now there are 14 huge levels. And each level will have a totally different vibe and feeling from the previous one.

At this point, our levels are pushing the sector level of the *BUILD* engine itself. There have actually been cases where the editor has crapped out because the sector limit was surpassed. As a matter of fact, we had to rewrite portions of the *BUILD* editor to increase the size of the grid.



***Redneck Rampage* will push the *BUILD* engine to its limits.**



Polygon objects and chickens galore await your superior firepower in this hillbilly first-person action game.

boot: The enemies in *RR* are extraordinary. How did you bring these frightening specimens to life?

Markham: We took great care when it came to designing and building our enemies. We followed the same philosophy we took with building our levels and decided on slightly fewer enemies with greater detail and behavior.

Now I'm a wantin' some big, fat, juicy ham hocks...

After the initial conceptual phase, our character artists sculpted 24-inch clay models and digitized them to generate the 3D models. From there, they were texture mapped and set aside. We then built polygon-reduced "stand-in" models for our animators to use in specialized motion-capture sessions with live actors.

From there, the motions were processed in *Alias Animator* and frame pics taken to generate the 180 to 200 frames of animation for each enemy. That may seem like a lot to do for a 180x110 pixel 2D sprite, but the end result *is* extraordinary. The characters look and feel as if they have a life of their own.

boot: What interaction can we expect from *Redneck Rampage*?

Markham: Interaction with the environment is really important to us. Once again, we would like to take our hats off to 3DRealms and Apogee for creating *Duke Nukem 3D.* The environment they created was incredibly interactive. We've done the same thing with *Redneck Rampage*: windows break, floors creak, jukeboxes play hillbilly music, and yes, you can pick up a bottle of cheap-ass whisky and drink it to gain health. We've also added an abundance of livestock (or "fodder" as we like to call it) to screw with. Cows, chickens, mosquitoes—even bodacious bovines—roam the countryside. The chickens that roam everywhere will lay eggs and you'll even be able to "tip" cows.

boot: What's the highest resolution this game will play at?

Markham: The minimum resolution will be 640x480, but the highest resolution is actually user-dependent. I have played the game in 1280x1024 on my Pentium Pro 200.

boot: Will *RR* utilize any form of hardware acceleration?

Markham: Since we've been able to maintain an average of 18fps on a P100 by code optimization, hardware acceleration was unnecessary.

boot: Will there be multiplayer mayhem in *RR*? Internet?

Markham: Yes, Yes, *Yes.*

— Andrew Sanchez

product info

AVAILABLE: april 97
PRICE: TBA
DEVELOPER: Xatrix Entertainment
PUBLISHER: Interplay
PHONE: 800.468.3772
URL: www.interplay.com

boot reviews

KICKIN' THE TIRES ON THE LATEST **HARDWARE** AND TAKIN' THE NEWEST **SOFTWARE** OUT FOR A SPIN

H/W

66 **Polywell** 500MX8
70 Fujitsu **LifeBook** 555T
72 **Compaq** Professional **Workstation** 5000
74 Intergraph **TD-200**
77 **Nokia** Multigraph 445Xavc
78 Compaq **Presario** 1030
83 **MIDI Land** MLi-370Q and **MLi-S20 Plus**
86 Sony **Vision**Touch
86 MIDI **Timepiece** AV
87 **Force** FX
88 Sony **Multiscan 200sf**
89 **Panasonic** KCXL-783A
  Axonix **ProMedia** 10XR
  Sony PRD-**650WN**
91 Thrust**Master: F-22** Pro, X **Fighter**, Top **Gun**
92 **WYSE**vision **WY-17PS**
92 **Assassin** 3D
94 Simple**Station**
94 AI**Gotcha**
95 **IMS** Twin**Turbo** 128P
95 Hercules **Dynamite** 128/Video
99 **33.6**Kbps Modems by **Comstar,** Best **Data**
100 Rimage **Perfect Image** CD Printer

S/W

69 **Privateer 2:** The Darkening
76 **Golf Sims: Sim**Golf, PGA **Tour 96, Links** LS
82 Trilogy Mania: **Die Hard** and **Alien** Trilogy
84 **Jet Fighter** III
85 Sim**Copter**
85 **Free**Hand **7**
88 **Destruction** Derby **2**
90 **Masters** of Orion II
90 US **Navy** Fighters '97
93 **Classic** Board Games: **Battle**ship, **Risk**
96 Daytona **USA**
98 **A-10** Cuba!
98 Photo**Studio**
100 **Star Trek:** Borg
100 Internet **VoiceMail**
101 **V-Realm** Builder
102 Who's **Fat Lou?**
102 **Diva-X:** Rebecca
102 **Leisure** Suit **Larry** 7: **Love** for Sail!
102 The Lords of **Tantrazz**
103 **Phantasmagoria 2:** A Puzzle of Flesh
104 War **Wind**
104 **Blood** & Magic
104 **7th** Legion
104 **M.A.X.**

H/W

Polywell 500MX8

Doin' the MMX bump 'n' grind

DOUBLE TAKE

THE 500MX8 IS A RAVENOUS BEAST WITH A REMARKABLY LOW PRICE POINT; BUT I'D PAY A FEW DOLLARS MORE TO INCLUDE THE NONEXISTENT USB PORTS, GAME CONTROLLER, WAVETABLE SOUND CARD, AND MMX TITLES.

- BDR

Welcome to the MMX dance. Against that wall are all the big-name systems: Compaq, HP, Gateway (see reviews in *boot* 06). Over here is one of *boot*'s favorite build-to-suit vendors, Polywell. Can a relative unknown tango with the big boys when it comes to bleeding-edge technology such as MMX?

The Polywell 500MX8 embodies everything you'd want in a system—solid performance, exemplary upgradability, and you can have Polywell customize the system to suite your needs.

Once inside these sugar walls, a 200MHz Pentium with MMX technology coupled with 512K of pipeline burst L2 cache breathes life into the 500MX8. Armed with Intel's 430VX PCIset, four 72-pin SIMM and two 128-pin DIMM slots, Tyan's S1472 Pentium ATX form-factor motherboard comes correct with no fewer than five PCI slots to fulfill your upgrading fantasies. Curiously, Polywell failed to provide any full-length card brackets on the far end of the slots, so full-length cards may sag over time, unless you provide your own brackets.

Three ISA slots are also available, but the shared PCI/ISA combo is occupied by a genuine Creative Labs Sound Blaster 16—no wannabe "compatible" sound card here. While the SB16 PnP does not deliver wavetable synthesis from the get-go, adding your favorite Roland or Yamaha daughterboard via the integrated WaveBlaster connector does not require giving up a precious slot.

An ATI 3D Xpression+ PC2TV (reviewed in *boot* 05) pumps pixels from one of the PCI slots, but leaves three open to play with (four if you shift the SB16 out of the shared PCI/ISA slot—a highly recommended maneuver). Our system came with Sampo's Alphascan 17mx 17-inch monitor—an adequate performer, but it lacks the ability to handle high refresh rates.

Seagate's 2.14GB EIDE hard drive provides speedy data transfers. The EIDE connectors on the motherboard, however, perilously straddle between the PCI slots—adding full-length cards will require some internal ribbon cable rearranging. Both EIDE cables are armed with the appropriate extra connectors, as is the floppy drive cable. One free 3.5-inch and two 5.25-inch drive bays remain free, while removing one screw and a simple tug backward releases the bottom 3.5-inch internal drive cage for service or additions.

Win95 dominates the 500MX8—so much that Polywell failed to install a properly working config.sys file for the components installed on the machine! No CD-ROM device drivers loaded when booting into DOS mode. Do yourself a favor—if you order any system from Polywell, make sure you order a dual boot system, with a DOS 6.x/Win95 combo, so you'll be able to dig DOS-specific titles such as *Privateer 2.*

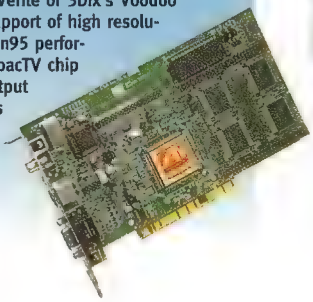
The 500MX8 dirty danced through the benchmarks, meeting or exceeding every test we threw at it, whether we gibbed ravenous Shamblers in *Quake* or rendered scenes in *LightWave 3D*, the system's raw horsepower could not be denied. The one exception was our Adobe *Photoshop* test, which yielded less-than-stellar results. Playing *Pod* was high frame-rate heaven, easily exceeding 30fps. Gameplay proved more responsive than Compaq's Presario 8772 (reviewed in *boot* 06). If only Polywell had included a game pad...

Polywell's 500MX8 may not have fancy integrated volume controls or enticing one-touch keyboard buttons, but what it does pack is rock-hard performance and awesome upgrade potential. And if you need a modem, or if the Quickshot speakers, or the Sampo monitor, or the ATI card don't get you sweaty, let them know—they'll set you up with a better partner... a luxury many bigger companies turn a deaf ear toward.

— Andrew Sanchez

Dirge for the ViRGE

While the ATI 3D Xpression+ PC2TV found in the 500MX8 may not pack the polygon punch as Rendition's Vérité or 3Dfx's Voodoo Graphics, its support of high resolutions, grand Win95 performance, and ImpacTV chip (for viewing output on a TV) makes this a much sweeter alternative to S3's flaccid ViRGE chipset.



under the hood

the brains

CPU	Intel Pentium 200 MMX (P55C)
L2 Cache	512K (external pipeline burst)
RAM	32MB EDO DRAM expandable to 128MB
Video	ATI 3D Xpression+PC2TV w/4MB EDO-DRAM (3D Rage II)

the brawn

Hard Drive	Seagate ST32140A 2.14GB EIDE
CD-ROM	Toshiba XM-5602B 8x IDE
Expansion Bus	Four full-length PCI slots (one occupied); two full-length ISA slots; one full-length shared ISA/PCI slot (PCI occupied)
Fax/Modem	None

the beauty

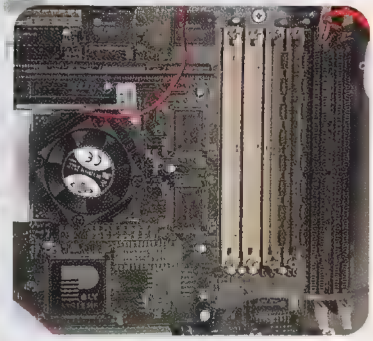
Display	Sampo Alphascan 17mx 17-inch SVGA monitor
Sound Card	Creative Sound Blaster 16 PnP
Speakers	Quickshot 600 Sound Force Speakers

the bundle

Windows 95 • Microsoft Creative Writer • Microsoft CD Samplers (two CDs) • Encarta 96 Encyclopedia • Microsoft Works & Money • Microsoft The Magic School Bus

the goods

Polywell's 500MX8 may not win any beauty pageants with its non-discrete beige tower, but inside it has room to grow and packs performance galore.

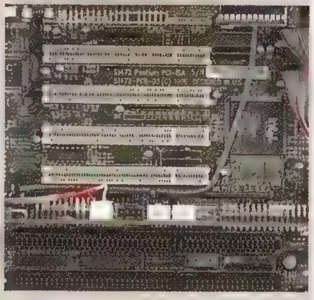


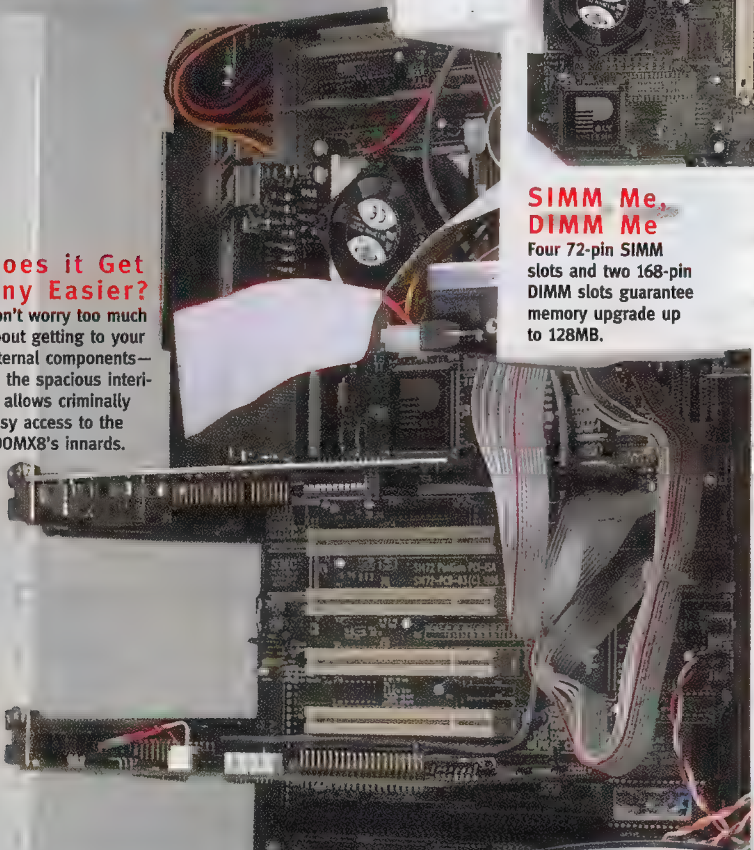
SIMM Me, DIMM Me

Four 72-pin SIMM slots and two 168-pin DIMM slots guarantee memory upgrade up to 128MB.

So Many Slots... So Little Time

With Tyan's S1472 ATX motherboard, you can bet your bottom dollar that these four free PCI slots are ready for just about any new card you can pop in there. Let's see... 3Dfx or PowerVR? SCSI? 3D audio? You get the picture.





Does it Get Any Easier?

Don't worry too much about getting to your internal components—as the spacious interior allows criminally easy access to the 500MX8's innards.

+

- Custom-built to your needs
- 200MHz Pentium with MMX
- ATI 3D Xpression+ PC2TV
- Five PCI slots
- Simple access to all components
- Four SIMM and two DIMM slots
- Tons of room for expansion

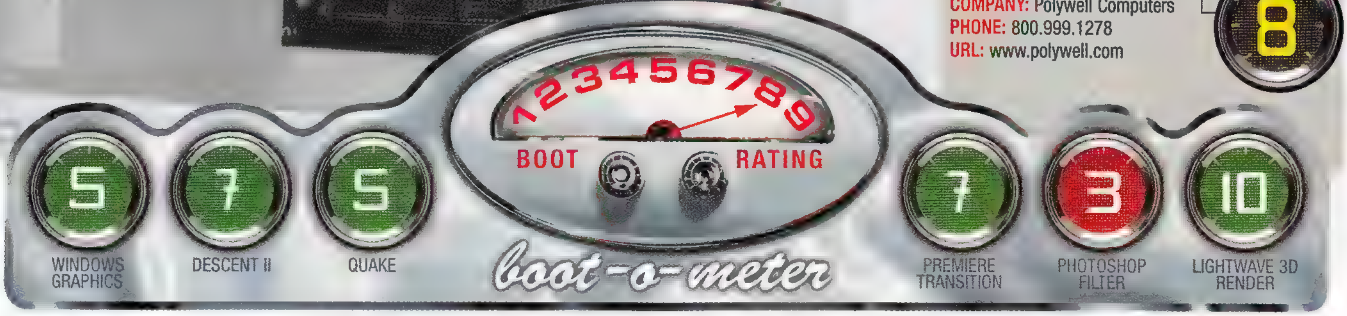
−

- Weak speakers
- No modem
- No game pad
- Sampo monitor can't handle high refresh rates
- No MMX titles in bundle
- No USB ports

boot verdict

PRICE: $2550
COMPANY: Polywell Computers
PHONE: 800.999.1278
URL: www.polywell.com

8



A complete breakdown of benchmark results is available on the *bootNet*. Point your browser to www.bootnet.com

THE WORLDWIDE
REPORTER

$ 1.39 / $ 1.69 Canada

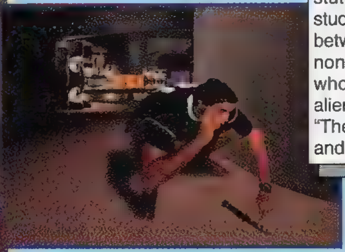
It's EXTRA-TERRESTRA-ORDINARY!

SHOCKING PHOTOS INSIDE!

Telepathic Tullahoma teen teams up with drunken spacemen to solve intergalactic crime spree!

TULLAHOMA, TN–It's interplanetary fame for Gerry Smith, 14, a ninth grader who helped save otherworldly beings from a shapeshifting serial killer! Gifted with ESP from birth, Smith was hand-picked by the ETs for his uncanny method of gathering clues–by seeing the past through the eyes of aliens! Is his reward forthcoming? Well, sort of... The aliens agreed to pay Gerry back on *his* terms–with a lifetime supply of pork rinds!

"One minute I'm tearing the wings off flies in my room, the next I'm a space detective for purple people from another planet!" stuttered the stunned high school student. Strangely enough, the liaison between Earth and Armpit VI was none other than Steve Meretzky, whose extensive experience with aliens has been well-documented in "The Hitchhiker's Guide to the Galaxy" and numerous other space epics.



Product Information Number 305

Mind-reading mogul Smith celebrates with soused patrons of the Thirsty Tentacle, the bar where he uncovered multiple clues.

SEGASOFT

www.segasoft.com

SPACE BAR
TM

Just another CD-ROM game where you're a psychic gumshoe detective trying to solve a murder by mind-melding with drunken aliens.

For a free Windows '95 demo or to order The Space Bar direct, call 1.888.SegaSoft

RATING PENDING RP CONTENT RATED BY ESRB

Designed for Microsoft Windows 95

Mac OS

Developed by Rocket Science and Boffo

©1997 SegaSoft Inc. All rights reserved. Portions of The Space Bar©1997 Rocket Science Games, Inc. All rights reserved. Portions of The Space Bar ©1997 Boffo Games, Inc. All rights reserved SegaSoft and the SegaSoft logo are trademarks of SegaSoft Inc. Rocket Science and the Rocket Science logo are trademarks of Rocket Science Games, Inc Boffo, the Boffo logo and The Space Bar are trademarks of Boffo Games, Inc

S/W

Try it out! demo on the bootDisc

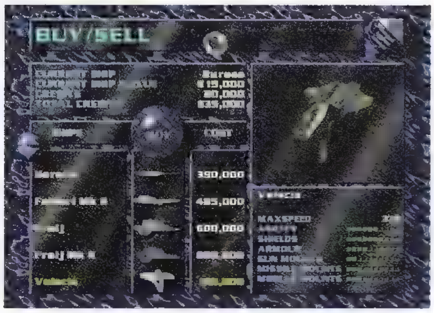
Privateer 2: The Darkening

Will kill pirates for food

Surrender to the seduction that lurks in the sweatier side of *Wing Commander* in *Privateer 2: The Darkening*. If this game of intergalactic wheeling, dealing, and dogfighting doesn't wet your whistle, then they'd better cart your ass off to the morgue.

You are Lev Arris, a man blessed with amnesia and cursed with a fat credit rating. Within a sector of space unknown to the *Wing Commander* universe, you must rediscover your past, all the while dodging assassins summoned to punish you for crimes yet unknown. Along the way, seek out a new life as a bounty hunter, black-market arms dealer, or cargo runner. It's all about making that almighty credit and survival, so get going!

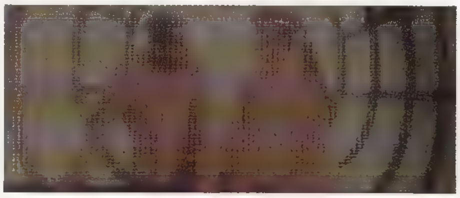
The Darkening lives in a world of violent extremes. The in-flight 640x480 256-color SVGA graphics surpass anything else on the market. A completely new flight engine, using an optimized *BRender* real-time 3D engine, propels *The Darkening*'s star fighters, transports, and immense capitol ships as close to perfection as any space flight sim is going to get. Intense visual effects, such as lens flares, high-res textures mapped upon polygon star crafts (ranging from 200 to 350 polygons for fighters; up to 650 for a Dreadnaught), multi-directional light sourcing, semitransparent cross-hairs, and looming polygon planets, highlight *The Darkening*'s space-faring experience. See that gleam of starlight bouncing off those ships? Thank the in-game Phong approximated shader for the strikingly specular highlights.



The best ships credit can buy, can be yours... for a price.

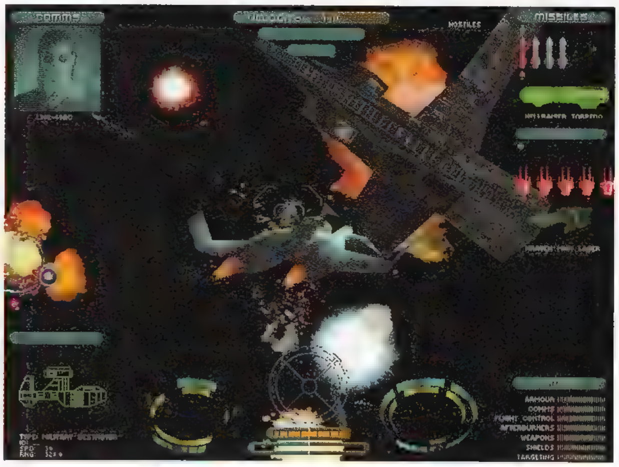
Frame rate hovered around 18fps to 24fps on our P200 system and dogfighting is still playable on a P90. And we hope you have a good programmable joystick, because *The Darkening* only supports a two-button joystick or joystick with throttle control.

3D Studio-rendered cut scenes mixed with live-action FMV (utilizing real sound stages) invoke a cinematic experience that would even make Lucas do a double take. However, interlaced 320x400 256-color video *will* make your 4x feel inadequate.



Even at 256 colors, the cinematics seem choppy on even the fastest CD-ROM drive.

Despite all the love and attention lavished on the visuals, other niceties were either poorly implemented or totally ignored. The only people you can interact with in space are the hostile ones—nice folks don't feel like talkin' much out there. And what about the repetitious taunts?! Same-ass voice for at least two different-looking enemies. For the money they spent on hiring one or two bigwig Hollywood actors, they could have hired five to 10 voice-over actors, each doing several different voices and then voila! Voice variety.



***Privateer 2: The Darkening*'s awe-inspiring graphics can't be touched.**

And what's with no animation in the video communications? All previous *WC* games had it... why not here? Like its later *Wing Commander* siblings, *The Darkening*'s breathtaking side-scenes reveal very limited interaction with people and objects (again, using the *WC3*-style binary answer system for "interaction" when people *can* be spoken to). Hey Origin, a little less on the "movie" and a bit more on the "interactive," OK?

The saving grace in *Privateer 2* is the immense scope of the game. The three CDs the main plot unfolds upon are filled with all the plot twists and double-dealing you'd expect. Like the original, *Privateer 2* doesn't stop when the main plot comes to a conclusion—you're free to continue your privateering as long as you want.

And in the end, isn't that what we all want in a game?

— Andrew Sanchez

boot verdict

PRICE: $59.95
DEVELOPER: Origin Systems
PUBLISHER: Electronic Arts
PHONE: 800.245.4525
URL: www.ea.com/origin

9

BRender

The power behind Privateer 2

The 3D muscle behind *Privateer 2* lies with a highly customized and optimized version of Argonaut's Blazing Renderer (*BRender*) Power Rendering System. *BRender* provides game developers with 32-bit hand-optimized assembler code, and a host of developer-definable options that rival anything Microsoft promises with Direct3D—*BRender*'s ready to meet the challenge of real-time, software-based 3D polygon rendering.

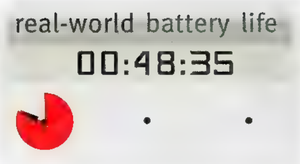
Eighty-six thousand texture-mapped, perspective-corrected, smoothly lit polygons per second; and up to 122,000 lit, flat-shaded polygons per second are among the published *BRender* specs; while 16-bit Z-buffers, hidden-surface removal, and fully-programmable colored light sourcing are among its other talents.

In this day of 3D accelerators, *BRender* may seem a bit dated, but fear not—the latest version (v1.2.1) supports hardware-accelerated *BRender* solutions and all the hot technologies (bilinear filtering, mip mapping, 16-bit color depths). Currently, the only consumer chipsets supported by *BRender* is S3's ViRGE, and Yamaha's RGV2. MMX support is forthcoming with newer drivers, so *BRender* will still live on after the MMX bomb drops.

If you expect to pick up Argonaut's latest *BRender* tools and make the next kick-ass space sim, you'd better be ready to sweat, as Origin burnt many a candle customizing and optimizing the basic *BRender* engine to render those intergalactic objects in *The Darkening*.

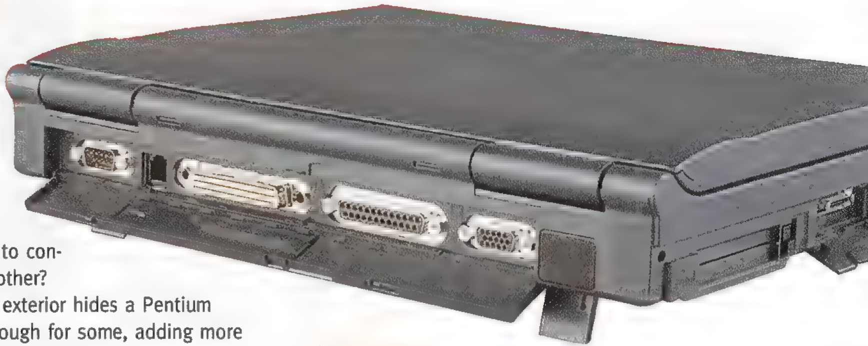
For more info: www.argonaut.com

— AS



Fujitsu LifeBook 555T

Baby, make my black case blue



Don't cry for me, Monte Carlo. Back in *boot* 04, we presented Fujitsu's feature-packed portable computing solution with our *boot* Kick-Ass award. Just three issues later, the Monte Carlo is dead meat on a dull stick. But life goes on, and Fujitsu has filled the void with the new LifeBook series of notebook computers. These models sport a new exterior and a number of performance improvements. But, does it have what it takes to continue the performance legacy started by its dearly departed brother?

Weighing in at 7 pounds, 3.5 ounces, the svelte, dark-blue exterior hides a Pentium 54CSLM 150MHz CPU. While 16MB of EDO-RAM may not be enough for some, adding more memory is as easy as popping off the keyboard and exposing the DIMM slot.

There's been some major exterior redecorating: The left bay is now home for the main lithium-ion battery; the right bay is designated a "multi-function" modular bay, which ships with a 6x CD-ROM drive installed, but this can be swapped with either the system's 3.5-inch floppy drive, a second Li-ion battery pack, or a second hard drive. The 555T ships with an external 3.5-inch floppy drive adapter—but you *cannot* use any other modular device, such as the second battery, with it. Speaking of batteries, Fujitsu dropped one of the Monte Carlo's most appealing features: the LCD that remained visible when the lid was closed. Fujitsu also replaced the innovative ErgoTrac pointing device found on the Monte Carlo with a more conventional Alps GlidePoint two-button pad.

The Chips & Technology video subsystem, primed with 2MB of VRAM, paints the 12.1-inch active matrix LCD with 64,000 colors at 800x600 resolution. Thankfully, Fujitsu's designers kept the analog brightness control slider on the right side of the display. The LCD remains sharp and legible even when viewed off axis. For multimedia mavens, Zoom Video support stands ready for any ZV/PCMCIA cards you'll plug in.

Besides all the standard series/parallel ports and built-in 28.8 fax/modem, Fujitsu finally added a docking station interface (sorely missed in the Monte Carlo). The docking station and modem connector are revealed by a smaller, hard-to-open sliding door, while the rest see the light of day via the 555T's easily removable fold-out cover. If you want to fire up an external keyboard, numeric keypad, or mouse, you'd better be ready to choose only one, as the 555T offers only one PS/2 connector. A rear-mounted IrDA 1.0 infrared port rounds out the communication ports.

The LifeBook 555T's feet cause problems when opening the CD-ROM drive, and the feet aren't very sturdy. The lack of a game port is a serious faux pas—do we have to cough up a PCMCIA slot for one? Also, the 0.28mm speakers, strategically located *away* from your wrists, produce a thin, tinny sound devoid of any type of lower midrange "ooomph."

The 555T's overall performance would make its departed brethren proud, blazing through all our tests with the exception of Windows graphics performance, which dipped a couple of notches, and inexplicably abysmal *Photoshop* performance.

Fujitsu may have already composed a requiem for the Monte Carlo, but the LifeBook 555T makes a worthy aria... if you don't mind your notebook in a shade of blue.

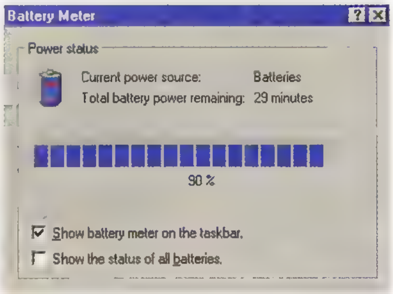
— Andrew Sanchez

DOUBLE TAKE

SHORT BATTERY LIFE, SLOW IRDA, AND AN 800X600 SCREEN.... THIS IS A SOLID NOTEBOOK, BUT IT ISN'T PUSHING ANY BOUNDARIES. I EXPECTED MORE INNOVATION FROM FUJITSU—INSTEAD, THE 555T TAKES A STEP BACK FOR EVERY TWO FORWARD.
— CD

You are Cleared for Docking

At last, a docking station interface joins the rear-mounted ranks. It's a shame the smaller door is a pain to open. But, where's my joystick port?



Power status

Current power source: Batteries

Total battery power remaining: 29 minutes

90 %

☑ Show battery meter on the taskbar.

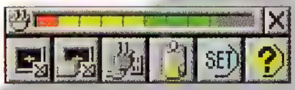
☐ Show the status of all batteries.

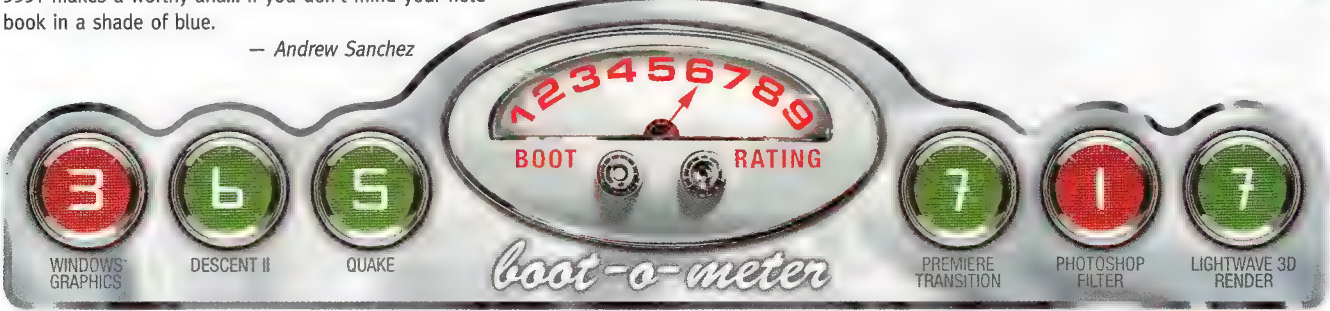
Status Report, Number One

You don't need Scotty to get an up-to-date status of your battery charge. Taking a peek at all your battery charges is a mouse click away.

Fill it to the Rim

A floating status bar helps you monitor your daily battery consumption. Power management options abound.





A complete breakdown of benchmark results is available on the *bootNet*. Point your browser to www.bootnet.com

under the hood

the brains

CPU	Intel Pentium 150
L2 Cache	256K pipeline burst
RAM	16MB EDO RAM (48MB max)
Video	Chips & Technology 65550 PCI w/2MB VRAM

the brawn

Hard Drive	Fujitsu FPCHDD01 1.3GB EIDE
CD-ROM	Matsushita UJDCD6711 6x EIDE
Expansion Bus	Two PCMCIA Type I/II or one Type III
Lap Weight	7 pounds, 3.5 ounces
Carrying Weight	9 pounds, 9.8 ounces

the beauty

Display	12.1-inch active matrix
Sound	ESS Technology ES 1878 FM synthesis
Video	800x600/64,000 colors (1280x1024/ 256 colors on external display)
Speakers	0.28mm stereo pair, headphone jack
Communications	28.8 fax/modem, IrDA port

the bundle

Windows 95 OSR-2 • Lotus SmartSuite • First Aid 95 Deluxe • Smart Games Challenge One • LapLink 7.0 • Quicken SE • WebEx 1.0 • AT&T WorldNet • FaxWorks • PC Doctor • SoftPEG9 • ExpensAble

the goods

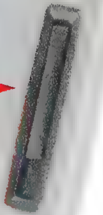
The Monte Carlo is a hard act to follow. The LifeBook 555T corrects a few of its shortcomings, but in the end, the package is just not as compelling.

Peekaboo!

While the 555T's LCD display gives you all the information you'll ever need, it's a pity you'll need X-ray vision to find out the status of your notebook when the display's folded down.

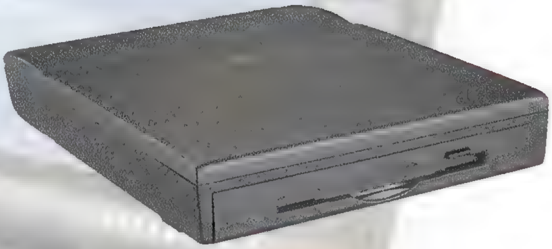
Dim Your Active Matrix Fire

Thankfully, the analog brightness control is still present and accounted for.



DIMM-Witted

Simply flipping open the cover and unscrewing two screws, makes access to RAM upgrade as easy as 1-2-3.



Driving Mr.LifeBook

The handy external 3.5-inch floppy drive eliminates the need for swapping out your CD-ROM drive in order to access your floppies. Considering it uses the same footprint as the right-side bay, you have to wonder why you can't put the second battery or hard drive in here.

Et tu, Ergo!

The ErgoTrac has wandered into the sunset along with the Monte Carlo, and the Alps GlidePoint has stepped in to take care of point-and-click business.

Double the Trouble

The right-side bay (currently occupied by the 6x CD-ROM drive) can also house the 3.5-inch floppy drive, a second battery, or even a second hard drive. The only thing you can shove in the left-side bay is the main Li-ion battery.

Light My LED

With its handy green LED, you'll know when the juice is flowing.

+

- DOCKING STATION PORT
- EXTERNAL FLOPPY DRIVE–SIMULTANEOUS USE OF FLOPPY AND CD-ROM
- ANALOG BRIGHTNESS CONTROL FOR DISPLAY
- MULTI-USE MODULAR EXPANSION BAY
- 2MB VRAM
- EASY ACCESS TO DIMM SLOT
- ZOOM VIDEO SUPPORT

–

- NO GAME PORT
- ONE PS/2 CONNECTOR
- CANNOT PLUG IN ANY OTHER PERIPHERAL TO EXTERNAL DRIVE ADAPTER
- LCD PANEL NOT VIEWABLE WHEN UNIT IS CLOSED
- SLOW IRDA PORT
- POOR BATTERY LIFE

boot verdict

PRICE: $4,399
COMPANY: Fujitsu PC
PHONE: 888.466.8434
URL: www.fujitsu-pc.com

7

H/W

Compaq Professional Workstation 5000

Open-heart operating system

If you've ever had fantasies of being a surgeon, holding the fate of a patient in your nimble hands as they dance about a cramped cavity, the Compaq Pro Workstation 5000 is for you.

With a screwdriver as your scalpel, cracking the PW5000's svelte case reveals a 440FX PCIset powered motherboard replete with dual CPU sockets. One of those sockets comes occupied by Intel's Pentium Pro 200, armed with 256K of L2 cache. Curiously, there is a fan mount close to the heat sink, but no fan. The low-profile desktop design demands some interesting motherboard configurations, with four PCI and two ISA expansion slots straddling a double-sided riser board that juts out vertically from the horizontal motherboard. While the three free PCI and one ISA slot on the left side of the riser are easily accessible, if you want to use the single PCI slot and single ISA slot on the right side, scrub up and brace for minor surgery. You'll have to yank out the entire riser board assembly. Thankfully, the riser board slips out effortlessly, without the need for tools.

The PW5000 comes with 64MB of RAM in its four DIMM slots (with three open), which can be expanded up to 128MB. But you'll need to don your smock again, as the slots dwell beneath the drive cage—and this time, you'll need to bust out those tools and tear the poor thing apart.

What the motherboard lacks in grace, it makes up for in features: An integrated SCSI-2 controller, an EIDE controller, and a 10/100T LAN adapter come stock with the motherboard, thus freeing up valuable PCI slots. The only occupied slot is filled by the ELSA GLoria-L GLiNT 3D PCI accelerator card. Unlike the Intergraph's Intense 3D card, ELSA is Win95 Direct3D and OpenGL compatible, and boasts *3D Studio Max* acceleration (via ELSA's GLiNT accelerated drivers).

And while space in the case is relatively snug, the 4.3GB storage space in Compaq's DFH5543 SCSI hard drive should suffice for most—which is important, because the PW5000 coughs up only *one* measly 3.5-inch internal drive bay. And, to rub salt on an open wound, it's a pain to get to!

When you first go to fire up the PW5000, you may think your patient is brain-dead. That's because the machine ships with no operating system on the hard drive. So prep stat to install Windows NT 4.0's more efficient NTFS file system for a single, massive 4.3GB partition (or FATten that drive if you're in the Win95 mood). While many will appreciate the option to install the OS their heart yearns for, you'll still need to partition that 4.3GB if you want other OS's to live in harmony (a tool such as *PartitionMagic*, reviewed in *boot* 05, does the job).

Running side-by-side with Intergraph's TD-200, the PW5000 turned in nearly identical *3D Studio Max* and *LightWave 3D* rendering times. However, the integrated SCSI controller coupled with the DFH5543 hard drive flexed its data-pushing muscle, blowing by the TD-200's EIDE solution with relative ease. The ELSA GLoria-L lurking inside may be able to handle 2D graphics better than Intergraph's Intense 3D, but in OpenGL performance, the Intense 3D had faster redraw times. And manipulating a 6,140 point OpenGL shaded object in *LightWave 3D*'s Modeler in four windows at 1280x1024 wasn't nearly as responsive as we expected.

Compaq's dual P-Pro motherboard packs an abundance of integrated goodies, and its 2D graphics performance is certainly nothing to sneeze at. But, with a cramped case that makes expansion painful, plus only one 3.5-inch internal drive bay, lack of an internal fan, and only average OpenGL performance, the PW5000 is not the healthiest choice out there.

— Andrew Sanchez

under the hood

the brains

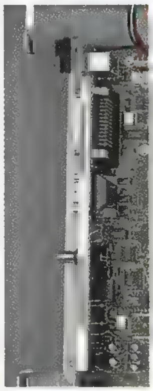
CPU	200MHz Intel Pentium Pro
L2 Cache	256K
RAM	64MB (128MB maximum on DIMM slots)
Video	ELSA GLoria-L 3D graphics controller (3DLabs GLiNT 500TX chipset) with 8MB VRAM frame buffer memory and 8MB DRAM Z-buffer and texture-map memory

the brawn

Hard Drive	4.3GB Compaq DFH5543 SCSI
CD-ROM	Matsushita CD-583 8x CD-ROM
Expansion Bus	One full-length ISA; three full-length PCI (one occupied); one full-length PCI/ISA shared slot
LAN	10/100 Base-T NetFlex 3 (integrated)

the beauty

Display	Compaq Qvision 210
Sound	ESS ES1868 16-bit sound card
Video	1600x1280@70Hz
Speakers	None (internal only)
Other	Symbios Logic C810 PCI SCSI controller (integrated onto motherboard)



Integration Galore

Integrated SCSI-2 and RJ45/BNC output connectors ensure free PCI slots for future upgrades.

Dietitian Not Required

Compaq's low desktop design means space is at a premium. Just about everything comes integrated into the tightly packed 440FX PCIset motherboard.

DOUBLE TAKE

THE PW5000 SPORTS SOME IMPRESSIVE COMPONENTS, BUT TO AVOID A POSSIBLE MALPRACTICE SUIT, COMPAQ WOULD BE WISE TO REPLACE THE DIMINUTIVE CASE, ADD A COUPLE OF 3.5-INCH DRIVE BAYS, AND BEEF UP THE MULTIMEDIA CAPABILITIES.

-BDR

Compaq Professional Workstation 5000 Test Results

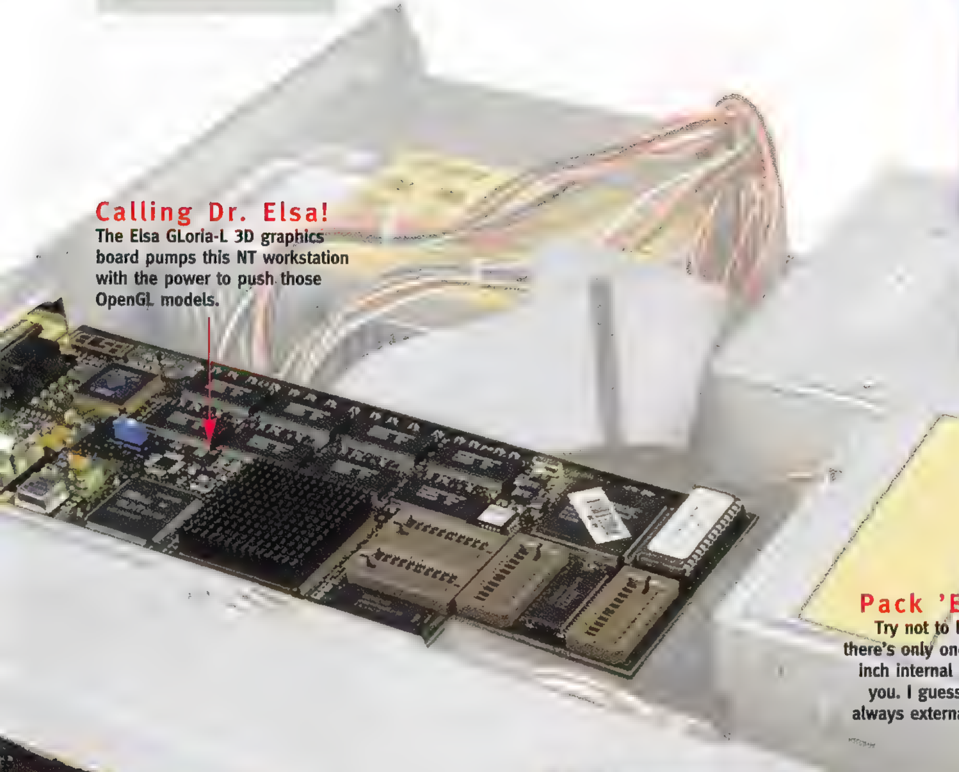
SysMark32 Official Run	151
3D Studio Max (KTX_RAYS.MAX)	6 min, 7 sec
LightWave3D 5.0 (raytrace.lws)	21 min, 41 sec
LightWave3D 5.0 OpenGL playback	4.19 sec
Adobe Premiere 4.2 test	47.53 sec
ZD WinMark 97 Business Graphics	35.5
ZD WinMark 97 High End Graphics	17
ZD WinMark 97 Business Hard Drive	960K/sec
ZD WinMark 97 High End Hard Drive	3210K/sec
ZD WinMark 97 CD	931K/sec

the bundle

Compaq SmartStart for Workstations CD-ROM • Windows NT 4.0

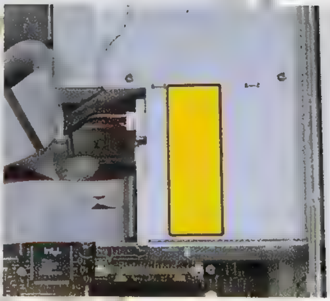
the goods

Don't let its diminutive size fool you—the Compaq Professional Workstation 5000's thin desktop casing packs an Intel Pentium Pro 200—perfect for those long nights spent rendering in front of a glowing monitor.



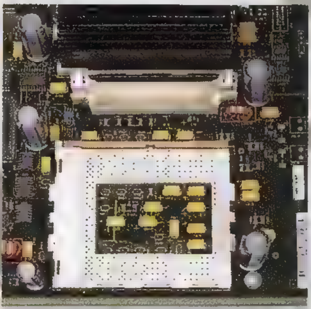
Calling Dr. Elsa!

The Elsa GLoria-L 3D graphics board pumps this NT workstation with the power to push those OpenGL models.



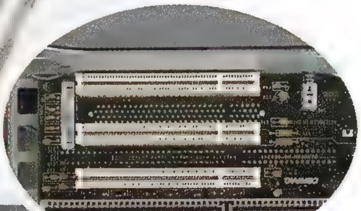
Pack 'Em In!

Try not to let the fact there's only one free 3.5-inch internal bay get to you. I guess there are always external devices.



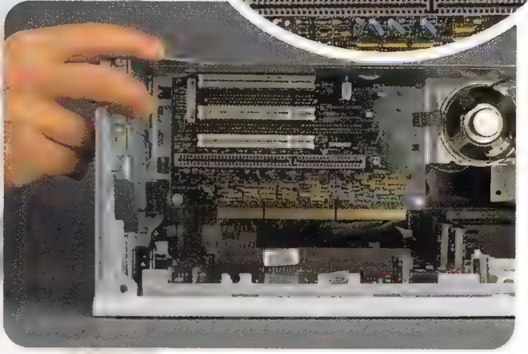
Double CPU Trouble

When you've pushed your system beyond the capabilities of a single Pentium Pro, you'll be thankful for that second CPU socket. Just make sure you get exactly the same CPU, OK?



Triple PCI Bypass

All three free PCI slots are within reach for easy additions.



Cover Me, I'm Going In

Four free PCI slots and two free ISA slots lurk inside Compaq's ultra-low profile, thanks to the perpendicular double-sided riser board. While the three PCI slot side is easy to get to, its neighboring slots on the other side require that you do some yankin'.

+	−
•Dual Pentium Pro CPU motherboard •Integrated SCSI-2 interface •Integrated 10/100T LAN connector •Three free PCI slots	•Riser board design obstructs right side slots •Harder to access DIMM slots •No CPU cooling fan •Internal speaker oddly mounted •ESS-ES1868 sound card

boot verdict

7

PRICE: system w/o monitor $8,299; monitor $1,899

COMPANY: Compaq
PHONE: 800.345.1518
URL: www.compaq.com

H/W

Intergraph TD-200

It's off to work we go

Make no mistake, Intergraph's TD-200 is definitely geared toward flexing 3D rendering muscle and serious work—not fragging friends in *Quake*. You can tell by the fuel that comes in the tank. Windows NT 4.0's beefy 32-bits powers this industrial-strength system. And the Pentium Pro engine humming under the hood is another indication that this baby's not for Sunday drives through the park.

A purple "TD" heralds the Intergraph's lineage, while the stylish tower case (complete with swing-out lockable drive door) lends desktop flare (albeit not as tawdry as SGI's desktop machines). Removal of the case is simplified by six large screw knobs—always a plus in our book.

Inside the spacious interior lurks a P-Pro 200MHz CPU on Intel's VS44FX single CPU, ATX-footprint motherboard (*not* Klamath compatible but OverDrive/MMX ready) armed with 64MB of EDO DRAM. The integrated EIDE controller and Crystal CS4232 FM-synth chipset free up I/O slots, so accommodations abound. Three full-length ISA slots and two PCI slots are free, and *everything*, from CPU to RAM, is within reach (without any funky riser boards to hassle with). Three open drive bays (two internal 3.5-inch bays and one 5.25-inch front-access bay) will satisfy most upgradaholics, and EIDE controller cables fitted with extra connectors for easy additions are also provided, as well as three extra power connectors. Outstanding!

Video (in the unit we tested) was driven by Intergraph's own Intense 3D card, complete with 4MB of texture memory. This bootWorthy (*boot* 03) 3D monster now has the anemic VGA support onboard (no second PCI slot required) and still processes an astonishing 100bpp at maximum resolution.

While the system includes all the standard amenities, such as a 3.5-inch 1.44MB floppy drive and 2.16GB hard drive, there are some additions we'd like to see on systems of this caliber. A SCSI interface would allow power users to merge onto the ultra-wide highway. Also, an a:drive (reviewed in *boot* 05), with its 120MB floppy disks and full backward compatibility with the 1.44MB variety, would be nice.

Since the system is oriented more toward a work environment rather than play, Intergraph provides minimal multimedia functionality—the Crystal CS4232 FM-synth chip is atrocious, and the puny Koss HD30 speakers (no subwoofer), while surprisingly clean and crisp, aren't pretty.

Intergraph's full WinNT 4.0 NTFS partitioning meant no *Quake* for us, so we stuck to our more productive benchmarks, where the TD-200 felt right at home. The *LightWave 3D* rendering time, when compared to our regular plain-Jane Pentium system, rocked the house, making real-time manipulation of OpenGL smooth-shaded models in *LightWave3D*'s four-windowed, 1280x1024 16-million color display smooth and effortless. *3D Studio Max* performance was just as impressive. Because this machine is geared toward OpenGL/3D rendering performance, the 2D performance of the included video card left us cold.

If you're ready to take the NT plunge, the Intergraph TD-200's solid performance and competitive pricing make it a fine place to start.

— Andrew Sanchez

DOUBLE TAKE

INTERGRAPH MAKES ONE HELL OF A WORKSTATION, PRICED TO MAKE SGI SWEAT. THE PITIFULLY POOR VGA PERFORMANCE WILL KEEP MOST GAMES FROM TEMPTING YOU AWAY FROM SERIOUS WORK, BUT WITH OPENGL QUAKE ON THE HORIZON, THIS MACHINE COULD SOON BE THE ULTIMATE QUAKE PLATFORM.

- CD

Intergraph TD-200 Test Results

SysMark32 Official Run	113
3D Studio Max (KTX_RAYS.MAX)	6 min, 9 sec
LightWave3D 5.0 (raytrace.lws)	21 min, 39 sec
LightWave3D 5.0 OpenGL playback	3.90 sec
Adobe Premiere 4.2 test	47 sec
ZD WinMark 97 Business Graphics	19.3
ZD WinMark 97 High End Graphics	15.8
ZD WinMark 97 Business Hard Drive	924K/sec
ZD WinMark 97 High End Hard Drive	2310K/sec
ZD WinMark 97 CD	872K/sec

under the hood

the brains

CPU	200MHz Intel Pentium Pro
L2 Cache	256K synchronous cache; four-way set associative; write back
RAM	64MB EDO DRAM expandable to 256MB
Video	Intergraph Intense 3D w/16MB SDRAM (4MB texture memory)

the brawn

Hard Drive	Seagate ST32161A EIDE 2.16GB
CD-ROM	Sony CD4311 8x CD-ROM 128K cache
Expansion Bus	Three full-length ISA slots; three full-length PCI slots (one occupied); one full-length shared PCI/ISA slot (PCI occupied)
LAN	10/100 BaseT Intel Pro 100 LAN port

the beauty

Monitor	Optional Hitachi 21SD107 21-inch multi-synch monitor Invar Shadow Mask, 0.26 dot pitch
Sound	Crystal CS4232 FM synthesis built into motherboard (wavetable optional)
Video	1280x1024 at 16.7 million colors, double-buffered
Speakers	Koss HD30

Video RAM Maximus

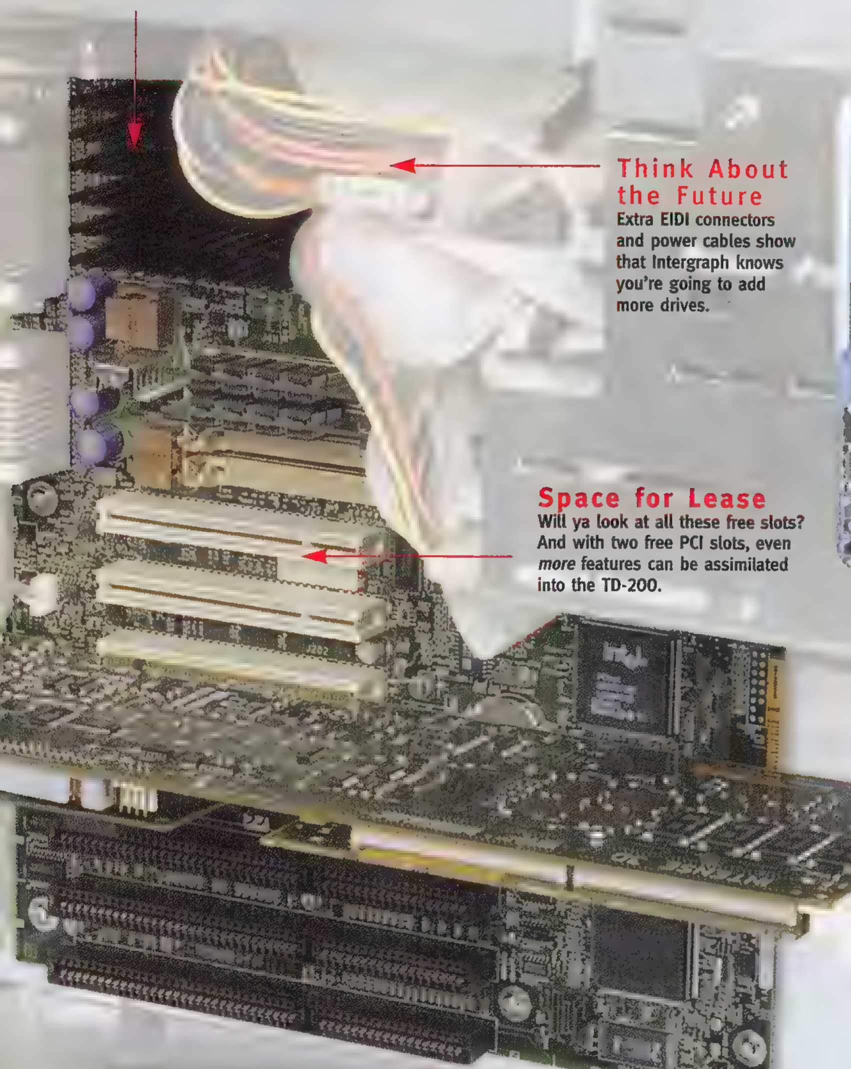
Intergraph's Intense 3D armed with a whopping 16MB of RAM will fill other video cards with RAM-envy. OpenGL and Heidi drivers make for maximum 3D animation efficiency.

the bundle

None

the goods

It may not be purple, but Intergraph's TD-200 packs some serious, yet affordable NT/3D rendering firepower.



Gentle Breeze Amidst the Heat Sinks

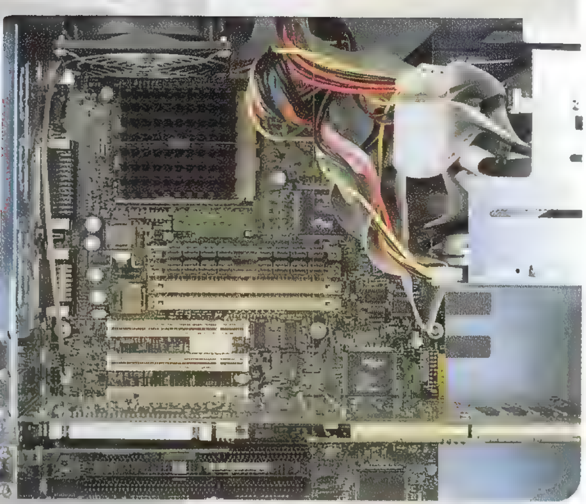
A powerful CPU needs powerful cooling—a fan and massive heat sink combo do the trick for the TD-200's P-Pro 200.

Think About the Future

Extra EIDI connectors and power cables show that Intergraph knows you're going to add more drives.

Space for Lease

Will ya look at all these free slots? And with two free PCI slots, even *more* features can be assimilated into the TD-200.



Heart and Soul

With its ATX motherboard design and sumptuous interior, getting to any of the hardware is a snap.

Behind the Beige Door

Unlock the TD-200's door and greet all your drives. Sick of the door? The polypropylene hinge is designed for easy removal and reattachment of the door, without having to bust out your toolkit.

+	–
•Pentium Pro 200MHz 64MB RAM •Two free PCI and four free ISA slots •Easy access to motherboard components •Intense 3D video card with 16MB RAM •Three year warranty (one year on-site) •MMX OverDrive ready	•Built-in Crystal sound card •Small, inferior [illegible] speakers •Weak VGA performance

boot verdict

8

PRICE: $5,274 for system w/o monitor; $2,335 for Hitachi 21SD107 monitor

COMPANY: Intergraph
PHONE: 800.763.0242
URL: www.intergraph.com

The Golf War

A look at the leader board

Computer sims give players a chance to experience something they'd never have the guts to do in real life, such as screaming around Monza in a Formula One car or hurling Hellfire missiles from the cockpit of an F-22.

So why golf sims?

Not everyone has the jingle to join an exclusive country club or the green fees for legendary links such as Pebble Beach. And getting Nicklaus or Palmer to pencil you in to their foursome is a challenge. So when your schedule has you spending more time staring at a tray table than at a dog-leg par five, your only recourse is on screen.

But with an entire shelf crowded with golf sims, you're confronted with a choice more difficult than deciding between a 9-iron and a pitching wedge. Here's a look at the leader board. — *Lee Buchanan*

Waiting for a Tee Time

Another threesome of contenders are set to tee off, and all of them look like they have the stuff of champions.

British Open Golf, from Looking Glass Technologies, sports very promising graphics and also features announcers, galleries, and a talkative caddie who's quick to offer advice. Packaged with two championship courses—St. Andrews and Royal Troon—this one looks like a winner.

From Sierra comes *Front Page Sports: Golf*, designed by the guys who created *Links 386* for Access. Given that heritage, it's no surprise that the early screen shots look promising. Could this be the next contender?

SimGolf may be the only course architect on the shelf at this writing, but looming on the horizon is Accolade's *Jack Nicklaus Golf: Gold Bear Edition*, which promises a powerful and intuitive course designer. An early peek at the *Gold Bear Edition* offers a glimpse of a powerful combination of course design and gameplay. We can't wait.

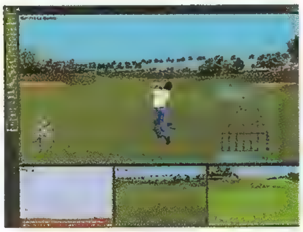
SimGolf

Build you own

Course variety isn't a problem with *SimGolf*, the first sports title from Maxis (*SimCity*). This sim lets you design your own course, with the help of noted course architect Robert Trent Jones. If you're a golf fanatic, the powerful course-building program is worth the price all by itself. If you don't feel like building your own course right away, you can play two of Robert Trent Jones' beauties—Rancho La Quinta in California or the Prince course in Hawaii.

But *SimGolf* doesn't quite measure up in terms of gameplay. While it runs at 1024x768 at 16 million colors, *SimGolf*'s graphics aren't as drop-dead gorgeous as those in *Links LS*. And there's no nail-biting tournament action like you'll find in *PGA Tour*.

SimGolf offers another unique feature—a mouse-driven swing. Pull back on the mouse for the back swing, then push forward to swing through the ball. It takes some getting used to, but the reward is greater control of your shots. Don't worry: There is a more traditional mouse-click swing method to fall back on. All in all, it's a great first effort.

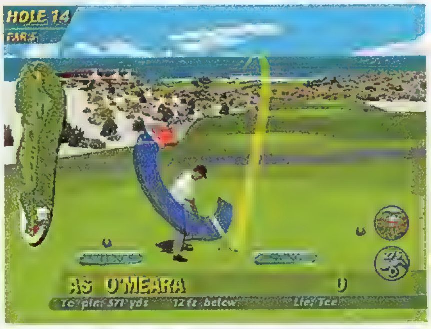


SimGolf's powerful course architect sets it apart from the crowd.

boot verdict

PRICE: $50
DEVELOPER: Access
PUBLISHER: Access
PHONE: 800.800.4880
URL: www.accesssoftware.com

7



Though the graphics look a bit dated against the new competition, the exciting tournament play keeps EA's _PGA Tour 96_ in contention.

PGA Tour 96

Drive for show, putt for dough

In recent years, the only serious challenger to the *Links* dynasty has been *PGA Tour* from Electronic Arts. The graphics are very good, though they don't quite approach the glory of *Links*. *PGA Tour 96* throws in two more courses, for a total of four. But what sets apart *PGA Tour 96*—allowing it to reside on my hard drive alongside *Links LS*—is the tournament play.

No other game offers four-round tournaments against an entire field of PGA pros, and it's a blast. You'll get a real feel for the gut-wrenching drama of professional golf when you're faced with a 10-footer on 18 to make par or miss the cut. Trouble is, you won't be a struggling pro for long. *PGA Tour 96* is just too easy. Once you get the timing down, holes-in-one and chip-ins are far too common, even at the most difficult settings.

boot verdict

PRICE: $45
DEVELOPER: Electronic Arts
PUBLISHER: Electronic Arts
PHONE: 800.245.4525
URL: www.ea.com

7

Links LS

Still the champ

boot KICK ASS! PRODUCT

Since Access unveiled the original, *Links* has been the benchmark for golf sims. Other sims have their merits, but *Links* has always been the best looking.

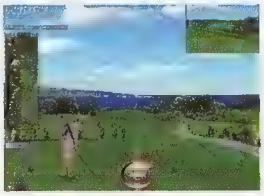
With screen resolutions as high as 1280x1024 and 16 million colors, this latest version's damn-near photorealistic graphics have solidified that claim. *Links LS* is a joy to play, even when you're having a bad round.

For this round, Access added modem play, computer opponents, and improved physics models for ball flight and roll. But most satisfying is the increased challenge in gameplay. At its toughest, *Links LS* is worthy of Tiger Woods.

The *Links* series also boasts the largest library of courses available for any golf sim. *Links LS* comes with three Arnold Palmer-designed courses, and upgrades any of the dozens of *Links 386* courses.

The only complaint you'll hear about *Links LS* is the steep hardware requirements. Get ready for some slow screen redraws on midrange Pentiums.

Links LS packs plenty of multimedia, including video interviews with Arnie, and all the golf most any duffer could ever want on its three discs.



Increased difficulty and improved ball physics help keep _Links LS_ at the top of the leader board.

boot verdict

PRICE: $45
DEVELOPER: Maxis
PUBLISHER: Maxis
PHONE: 510.933.5630
URL: www.maxis.com

9

Multigraph 445Xavc

It slices, it dices

I've always been leery of multipurpose products. Cutting firewood with the same Ginsu I cut my tomatoes with seems unnatural. The Multigraph 445Xavc, replete with 21-inch monitor, color digital camera, two-watt speakers, *and* a 10-watt subwoofer, is a real Swiss Army Knife of a display.

While video performance is excellent, overall, the 445Xavc lives down to our expectations.

At its core, the 445Xavc's 19.7 inches of viewable flat screen are amply suited for CAD/CAM, in-your-face gaming, or for those drooling for a *really* large Win95 desktop. The 0.22mm dot pitch and maximum resolution of 1600x1200—at 80Hz, no less, (or 1280x1024 at 100Hz!) resulted in a bright, distortion-free display. *DisplayMate* showed the image convergence to be good overall, with only a slight misconvergence in the bottom right of the display.

The speakers, positioned below the CRT, sound clean and fairly linear, reproducing high frequencies with sufficient velocity. Low- and medium-range playback is quite acceptable for standard multimedia applications and games. That Nokia even manages to integrate a three-way speaker solution (including the 10-inch subwoofer) inside a monitor is impressive, but at some point the compromises made to conserve desktop real estate fail to pay off.

The subwoofer kicks just enough thump to flesh out the low end, but lacks the rich, substantial bass delivered by a dedicated subwoofer (and who doesn't have room under their desk for one)? Crank the volume, and you'll be shocked to discover that the screen will begin bouncing around to the beat, accompanied by crackles from the speakers and extraneous noise. Not good.

The decision to integrate the audio controls into the on-screen control system, instead of providing the badly needed one-button volume control and external mute button is also dubious.

The 445Xavc is perfect for video conferencing, with its built-in color Sony CCD camera (NTSC and PAL models are available) centered under the screen, and a built-in microphone positioned at the top. The rear of the monitor is also adorned with RCA video outputs for connection to a video capture card (not included). Since performance is dependent on the capture card, and not the camera itself, we tested the 445Xavc with Intel's Smart Video Recorder III capture card, and found the resulting 320x240 image to be smooth, with upward of 30 frames per second.

The camera can be easily aimed by rotating the thumb switch on the front panel, but the upward angle can be problematic, especially when overhead lights make silhouettes out of all the camera's subjects. The complete omission of any external or software camera controls (such as brightness and contrast) is a mystery.

Another anomaly is the lack of a lens shutter and on/off switch—to protect the camera, (and in effect, turn it off). You have to tilt the camera vertically until the majority of the lens is no longer visible.

As a stand-alone monitor, the 445Xavc is excellent. But if you're serious about multimedia, you'll find the audio subsystem lacking, and the absence of external controls way too frustrating.

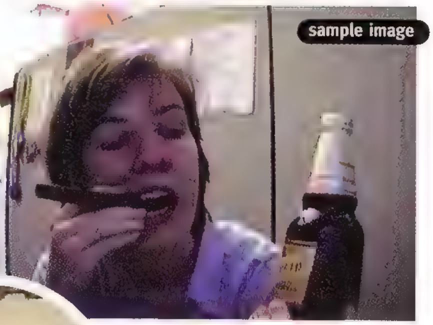
— *Bryan Del Rizzo*

For picture quality and technical capability, the 445avx can't be beat. Unfortunately, the multimedia components *can.*

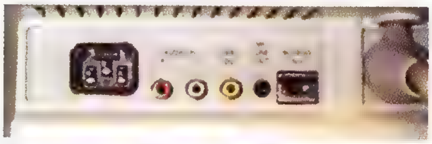
On Screen

The on-screen control panel is broken down into five categories: Language, Basic Adjustments, Audio, Geometry, and Image.

Basic Adjustments includes contrast, brightness, image positioning, and degaussing. Geometry adjustments includes width, horizontal and vertical centering, as well as pincushioning, trapezoid, orthogonal, and tilt corrections. Color, Moiré, and convergence adjustments are made from the Image submenu. Audio adjustments include volume, balance, bass, treble, and microphone output levels.



To prevent video images from being shrouded in darkness, you'll need to elevate the entire monitor a few inches to offset the camera's upward angle.



The rear of the monitor is adorned with RCA-out jacks for the audio and video, a microphone-out jack, and even an ACCESS.bus interface port.

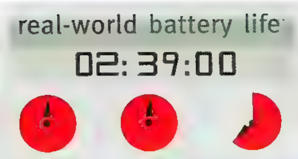
Tech Specs

Tube	21-inch Invar Shadow Mask(19.7-inch viewable)
Dot Pitch	0.22mm
Max Res	1600x1200 @ 80Hz
Horizontal Frequencies	30kHz to 102kHz
Vertical Frequencies	50Hz to 150Hz
Bandwidth	200MHz
Case Dimensions (HxWxD)	20.5x20.2x19.7 inches
Weight	71 pounds
Plug-n-Play	Yes; DDC Levels 1/2AB
Emissions	TCO'95, MPR-II
Power Management	VESA DPMS

boot verdict

PRICE: $2,399
COMPANY: Nokia
PHONE: 800.296.6542
URL: www.nokia.com

H/W



Compaq Presario 1030

A tasty morsel

Compaq has whipped up a delectable notebook for the portable-PC connoisseur who relies on their own checkbook, not corporate purchase orders. Served in a case the color of over-baked crème brûlée, the Presario 1030's ingredients have been carefully prepared and mixed to create a relatively fat-free treat, at only 8 pounds, 6.7 ounces.

The 133MHz mobile Pentium processor gets things cooking inside the 1030, along with 16MB of EDO DRAM, a 1.4GB hard drive, and a built-in 33.6Kbps modem. There's no external cache, but you'd never know from the numbers this dish serves up. And to tantalize your taste buds even more, both a 6x CD-ROM and 1.44MB floppy drive have been added à la mode. While the hard drive posted excellent results, the CD-ROM drive's transfer rate of only 373K/sec was somewhat undercooked.

The 1030 sports some impressive contours and looks quite delectable, in spite of its patina. The 11.3-inch SVGA display may be too nouvelle cuisine for those with hearty appetites, and considering its poor off-axis viewing, you won't want to share. And the display won't fold completely flat to accommodate an external monitor. The lid exhibited severe flex when even mildly adjusted.

The integrated NeoMagic MagicGraph128V video chipset with 1MB DRAM consistently delivered above-average performance in both DOS and Windows. The spiciest performance was in *Descent II*—at 640x480, the MagicGraph128V bubbled over with an impressive 19.4fps. Full-screen MPEG playback was smooth as cream, even without a hardware MPEG decoder. The MagicGraph128V's maximum resolution is 800x600, with a 16-bit color depth at 60Hz. With a CRT, refresh rates jump to 85Hz, and non-interlaced resolutions up to 1024x768, at 8-bit color depth. The MagicGraph128V is also VESA 2.0 compliant.

The aural experience was especially tasty. The extra-wide stereo speakers (mounted beneath the oversized deck) delivered clean, undistorted audio. Wavetable audio would've been icing on the cake, but alas, the 1030 is served with an ESS 1788 FM-synth chip instead.

Just about the only thing distinctly sour about the 1030 is its Sleep mode—it takes forever to wake up. You might as well restart the machine.

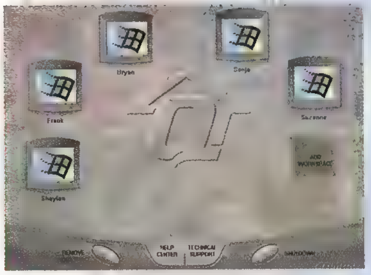
Overall, the 1030's low price point and well-rounded multimedia features will have serious PC fanatics salivating.

— *Bryan Del Rizzo*

DOUBLE TAKE

WHILE THE TACTILE RESPONSE OF THE KEYBOARD DOESN'T MAKE ME SALIVATE WITH HUNGER, BRYAN'S ASSESSMENT IS DEAD-ON—THE PRESARIO 1030, DESPITE THE WEAK CD-ROM PERFORMANCE, PERFORMS ABOVE AND BEYOND THE CALL OF DUTY. CONSIDER IT A TASTY CANDIDATE IF YOU'RE IN THE MOBILE COMPUTING MARKET.

-AS

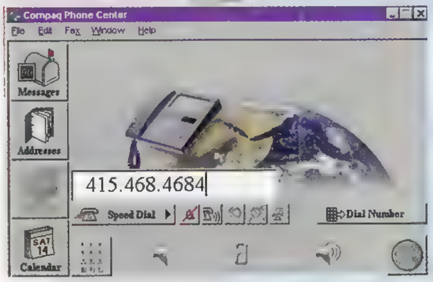


Serves Eight

The *SmartQ* software lets you create up to eight personal workspaces, each containing only the applications and files you want. From here, you can also easily access the online help center or Compaq's technical support department.

No Reservation Required

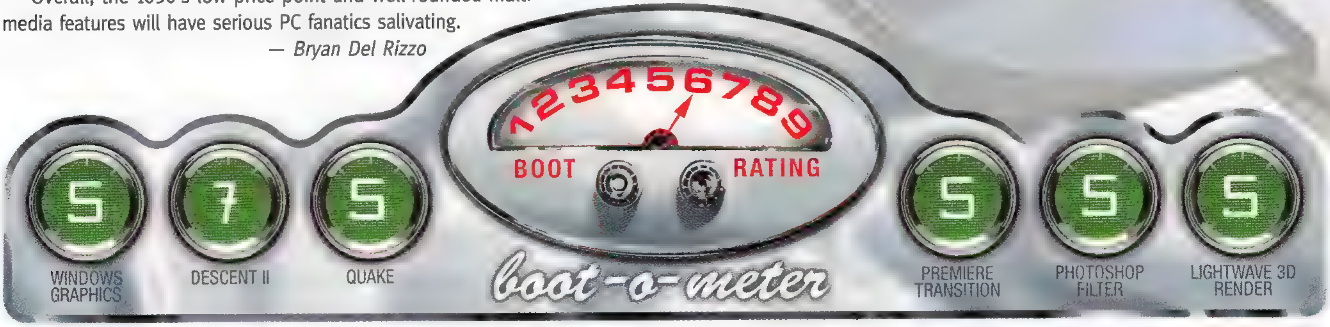
The Compaq Phone Center combines a full-duplex speakerphone, address book, send and receive fax capability, and an automated telephone answering machine. Compaq offers technical support seven days a week, 24 hours a day.



415.468.4684

Fortified with Iron

The mildly obese AC power adapter weighs in at 1 pound, 2 ounces.



A complete breakdown of benchmark results is available on the *bootNet.* Point your browser to www.bootnet.com

under the hood

the brains

CPU	133MHz Intel Pentium
L2 Cache	None
RAM	16MB EDO (48MB max)
Video	MagicGraph128V (1MB EDO DRAM)

the brawn

Hard Drive	1.4GB (various manufacturers)
CD-ROM	6x CD-ROM (various manufacturers)
Expansion Bus	Two Type II or one Type III PCMCIA card
Lap Weight	7 pounds, 5.4 ounces
Carrying Weight	8 pounds, 6.7 ounces

the beauty

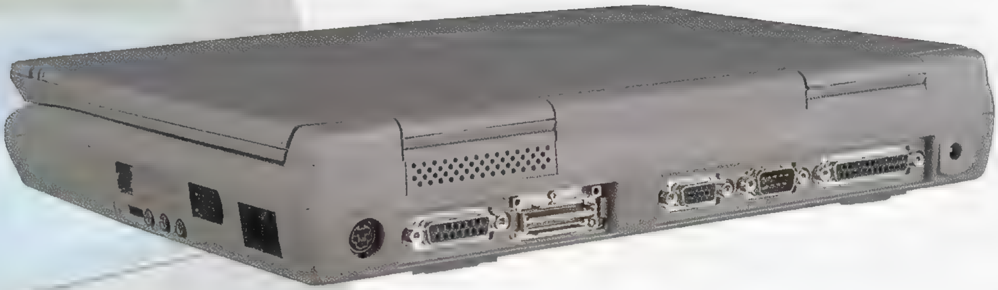
Display	11.3-inch active matrix
Sound	ESS Technology ES1788 FM synth
Video	800x600, 16-bit color
Speakers	Stereo, with passive bass ports and headphone jack
Communications	33.6Kbps modem

the bundle

Microsoft Works • Quicken • PGA Tour 96 • LapLink • Netscape Navigator • Dow Jones Personal Journal • Full Tilt Pinball Lite • Descent II• Compton's Reference Collection • GNN • America On-Line (version 2.5)

the goods

The Presario 1030 is a solid performer with some unique hardware additions, including the MagicGraph128V graphic chip and JBL stereo speakers.



Nap Time

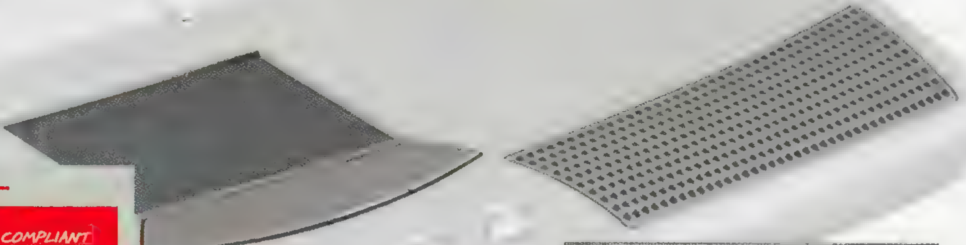
The 1030's battery isn't Win95 Power Management compliant, so you'll have to rely on the Status panel to monitor life expectancy (including charged, low, and critically low settings). The Presario is equipped with two power management features: Sleep and Hibernation. The Sleep feature allows you to reduce power consumption, while the Hibernation feature saves all open documents before shutting down. If the 1030 is sleeping when battery life drops below 10 minutes, Hibernation kicks in automatically.

After-Dinner Aperitif

The 1030 has ports for the usual devices including a PS/2 keyboard/mouse; MIDI/joystick; port replicator; serial, parallel, monitor, and AC adapter. However, there's no door or protective panel. The 1030 can also accommodate two Type II cards or one Type III PCMCIA card. Additional connections for microphones, headphones, and speakers can be found on the right, along with a much-appreciated volume control dial (you can also adjust the volume through software). A built-in 33.6Kbps modem and simultaneous, full-duplex speakerphone round out the communication features.

No Snap, Crackle, or Pop

The 1030's speakers are mounted on the front panel, but your hands or arms won't muffle the sound because the deck is so spacious. The speakers have good low- to mid-range reproduction, and access to the CD controls (play, stop, skip) is possible even when the lid is closed. To add richness and bass boost to the audio playback, passive bass ports are mounted up front.



+	−
•133MHz Pentium •Simultaneous CD-ROM and floppy drives •Standard 15-pin game port •Passive bass port •Accessible CD-ROM controls when display is closed •Extended battery performance •Excellent video performance •External volume control	•Not IrDA compliant •Can't gauge battery life in Win95 •Deep Sleep mode •Lackluster CD-ROM performance •Poor off-axis viewing

A Touch of Seasoning

You can adjust the sensitivity of the Synaptics TouchPad through software. Overall, it responds well, but buttons placed on the left and right of the pad would be preferable. The keyboard is a delight—airy and full of bounce—but the diet-sized spacebar is too small.

boot verdict

PRICE: $3,799
COMPANY: Compaq
PHONE: 800.345.1518
URL: www.compaq.com

8

FOR SOME PEOPLE THE **PC** IS MORE **THAN A MACHINE...**

IT'S AN **OBSESSION.**

Welcome to ***boot***, the new monthly magazine and CD-ROM from Imagine Publishing. Accompanied by its own unique Web site, ***boot*** is a rich, integrated environment and the only publication devoted to power-hungry PC freaks.

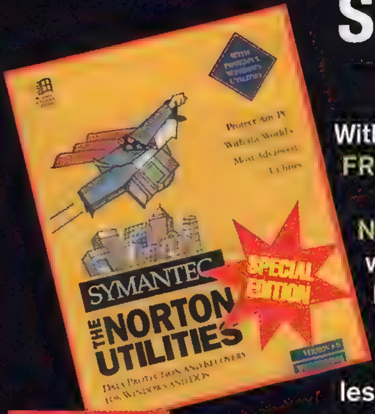
Every month, you'll get features that help you tweak today's PCs for screaming performance, expert reviews of the most revved up software, and hands-on hardware testing that goes beyond the statistics. In the past, you tore through all kinds of magazines, newspapers, and online sources to feed your need for the best.

Now you have it all in one place: ***boot***.

imagine
a new way of publishing

http://www.imagine-inc.com
597B5

SPECIAL CHARTER SUBSCRIPTION OFFER.

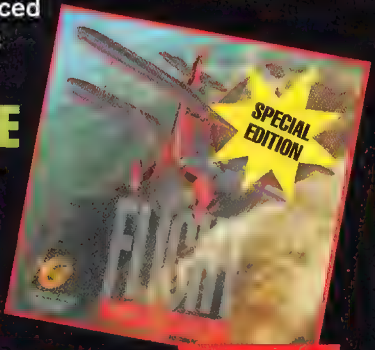

SYMANTEC
THE NORTON UTILITIES
SPECIAL EDITION

FREE

With your paid subscription to *boot*, you'll receive FREE special editions of two incredible CD-ROMs:

Norton Utilities—Is your PC a little under the weather? Finally, a computer doctor that makes house calls.

Flight Unlimited—Engage in 5 interactive flight lessons with full audio support and 6 aerial courses in this powerful flight simulator combining advanced physics with photo-realistic scenery.


SPECIAL EDITION
FLIGHT

FREE

Call 1-888-4IMAGINE

to start your subscription. You'll receive a full year of *boot* (12 issues and 12 CD-ROMs) for only $29.95 – a savings of almost

70% off the cover price.

PURE LUST

PURE ADRENALINE

PURE **PC** POWER

boot

Die Hard and Alien Trilogy

Two short of a dozen

Movies, like video games, share the same ungodly habit of spawning sequels. If a formula works (and makes tons of money), expect to see bastard children running about, squealing for your hard-earned dollar.

Fox Interactive's Die Hard Trilogy *and Acclaim's* Alien Trilogy *both take the big screen mayhem to your PC screen (after a brief stopover on the consoles) to recreate interactive worlds where you're the star, gunning down bomb-crazy terrorists and acidic xenomorphs.*

Bust pout the popcorn, 'cause it's time to go to the movies... er, video games!

— Andrew Sanchez

Die Hard Trilogy

Never a good day

If you thought the *Die Hard* series of movies had maximum violence, just wait 'til you try the *Die Hard Trilogy*—a mixed bag of knockoffs.

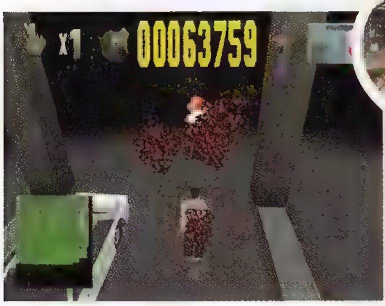
With a storyline spanning all three movies, you walk in the shoes of New York's favorite cop, a man who's always at the wrong place at the wrong time. Each movie is treated as a distinct game within *Die Hard Trilogy*; the original movie takes an over-and-behind point-of-view a la EA's *Fade To Black*; while *Die Harder* adopts a *Virtua Cop*-esque first-person rail shooter approach; and *Vengeance*, has you driving like a New York cab driver, in a high-speed chase to find and disarm yet another madman's bombs.

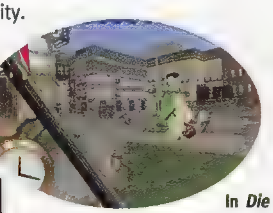
This Win95-native game lives in a fully texture-mapped polygon world, taking advantage of 3D acceleration (via Direct3D) and MMX (although we couldn't get both to engage simultaneously). While the bilinear filtering provided by a Rendition Vérité smooths out the otherwise low-resolution textures that fill the 800x600 SVGA world, don't expect silky smooth frame rates. Adding a game pad results in unbearably sluggish gameplay.

Inhabiting this crude polygon world are poorly animated polygon people. Look closely and you'll notice that their faces are texture-mapped photos of real people. 2D sprites are judiciously used throughout the game, with explosions and blood splattering consuming the majority.

Die Hard Trilogy is an uneven affair—the first sequence was amusing, but the *Harder* segment was trying. The driving with a *Vengeance* sequence had us playing hacky sack with pedestrians' mangled corpses (complete with blood splashing on your windshield), and howling with laughter.

Unfortunately, like most of this triage, the sluggish frame rate and wacky musical score (a mixture of techno and rap) keep the gaming experience from reaching maximum velocity.

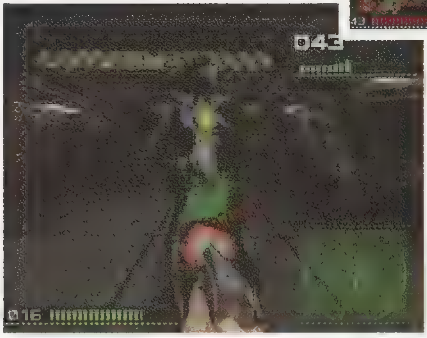




In *Die Hard Trilogy*, every day is a Sunday—and guess who gets to drive?

A well-thrown grenade in *Die Hard* helps even the odds.

Face huggers, chest bursters, and Queens... oh, my! In *Alien Trilogy*, you meet them all.



Darkened hallways may have worked for *Quake*, but *Alien Trilogy*'s corridors are just dark and boring.

Alien Trilogy

Game over, man!

Before you squish those nasties with as much firepower as you can carry, ask yourself: Does the PC gaming world need another DOS-based *Doom* clone?

If it's *Alien Trilogy*, the answer is, "No."

Play the role of Ripley in 30 outlandish missions that no sane person would ever take on in real life. Unfortunately, the adrenaline has been watered down and reduced to: "Run down dark corridors and kill everything that gets in your way until you find the exit."

Not exactly original.

Graphics, whether in 256 colors or 64k, suffer from low-resolution textures and a murky presentation. While the *Alien Trilogy* 3D engine utilizes a polygon-based terrain generator, the enemies degenerate into severely pixelated 2D sprites utilizing laughably choppy animation. The aliens look like they're doing a drunken jig rather than a menacing pounce. Even at its deepest color depths, *Alien Trilogy* fails to deliver any visual immersion. On the positive side, the game moves unbelievably swiftly at low resolutions—enough to induce motion sickness.

SGI/Wavefront-rendered cinematics are cleanly presented, re-enacting the marine landing sequence of *Aliens*. But the scenes only serve to show off Acclaim's motion-capture technology and the quality of their animators.

Sound effects are lifted straight from the movie, but unfortunately, the spirit and excitement of the *Alien* series were left behind. Not even four-player network mayhem can save *Alien Trilogy* from a mundane fate.

Overall, gameplay is uninspired and derivative—even the motion sensor has already been used in a first-person shooter (*Marathon*). Once again, developers rely too much on a tried-and-true formula, and wind up looking tired. Just like most sequels.

boot verdict

PRICE: $54.98
DEVELOPER: Probe
PUBLISHER: Fox Interactive
URL: www.foxinteractive.com

6

boot verdict

PRICE: $49.95
DEVELOPER: Probe
PUBLISHER: Acclaim
PHONE: 516.656.5000
URL: www.acclaimnation.com

3

MIDI Land Multimedia Speakers

Finding your acoustic Avalon

Can your insatiable thirst for sonic seduction ever be quenched? MIDI Land hopes their latest speaker offerings are just what your palate is waiting for.

With so many companies engineering your next trip down the multimedia highway, MIDI Land strikes hard with two radically different solutions to the age-old acoustic problem—how to pack thumpin' bass into a tight space. Whether you want a two-speaker solution, or a three-piece subwoofer/satellite combo, these speakers yearn for your attention.

But, do they truly hold the key to your acoustic Avalon? Read on...

— Andrew Sanchez

MIDI Land MLi-370Q

They ain't heavy, they're my speakers

Whatever you do, don't drop the MIDI Land MLi-370Q on your foot—you'll break something, and it could be your bank account.

The first thing you notice about these speakers is their weight—a desk-stressing 13 pounds for the pair. Popping off the grille reveals two of the three drivers: a one-inch dome tweeter and three-inch paper cone midrange that tend to your vocal and instrumental needs. In a bold maneuver, MIDI Land has mounted woofers inside the enclosures with output piped through a second ported enclosure in a single-reflex bandpass situation (something typically seen only with larger, free-standing subwoofer enclosures). The amp delivers 7.5 watts to each midrange/tweeter package and 20 watts to each woofer for a total of 55 watts of system power.

All the pertinent controls are located on the front (except for the power, which resides non-ergonomically in the back). A push-button engages the built-in QSound circuitry.

Putting these hefty puppies through the usual gamut of listening tests revealed fascinating results. Unlike the other MIDI Land speakers reviewed this month, the MLi-370Qs actually produced bass—not the room-shaking, filling-rattling type, but enough to add some low-end definition. Playing a Pink Floyd CD, while not on par with a dedicated subwoofer setup, created palpable thumps. Unfortunately, woofers that shoot through a port run the risk of introducing noise in the form of high-velocity wind moving through the vent and across the lip of the port—this results in audible huffing and fluttering noises. The four-inch woofer, when push came to shove, could not deliver adequate bass and responded appropriately with horrific wind noise, especially when *Quake* was cranked. Add the resonation from the plastic enclosure and your maximum volume experience will be short-lived.

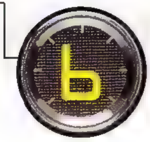
The midrange/tweeter combo is pleasant on the ears—not too harsh, ringing, or edgy (although a misadjusted treble boost will change that). Clair Marlo's vocals appeared a bit weak, but were audible in the center stage. With QSound engaged, the music or sound didn't dissolve into a shambling mockery of its former self—the circuitry added just a hair of echo and helped solidify the center channel. However, this is accomplished at the expense of a wider sound stage—instrumentation tightened around the center, destroying any sense of spaciousness.

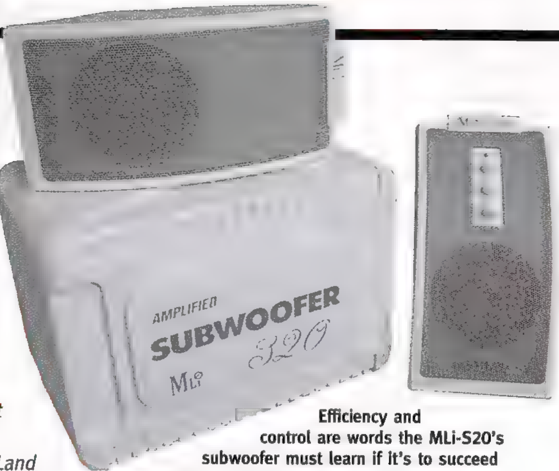
The MLi-370Q is one audacious speaker system. A bandpass enclosure, in any situation, is a tricky proposition to pull off, so MIDI Land is to be commended for even trying such a stunt. But at this high-end price, you'll definitely want to test drive some subwoofer/satellite combos before committing to these hollow alternatives.

Behind the scenes, a single four-inch woofer buried within each enclosure works that bass in MIDI Land's MLi-370Q's three-way setup.

boot verdict

PRODUCT: MIDI Land MLi-370Q
PRICE: $269.95
COMPANY: MIDI Land
PHONE: 909.592.1168
URL: www.midi-land.com





Efficiency and control are words the MLi-S20's subwoofer must learn if it's to succeed in reproducing that low-frequency thunder.

MIDI Land MLi-S20 Plus

Is this thing on?

Listen to the MIDI Land MLi-S20 Plus if only to hear how a subwoofer should *not* sound.

A sealed, 6mm-thick plastic enclosure houses a 20-watt amp and a 5.25-inch dual voice-coil woofer. A pair of three-inch drivers and a 10-watt amp are mounted in angled enclosures to deliver the mids and highs. Master volume control, along with bass and treble boost, are integrated into the left satellite. A total of 40 watts drives the system. Thankfully, no extraneous "sound enhancement" circuitry is integrated into this system—less likelihood of muddying your sound.

Sealed enclosures are notorious for lack of bass (if the box is built too small) and MIDI Land's sad woofer drives home this point. The woofer could not handle any of the extreme low-frequency tests thrown at it—Pink Floyd's heartbeat turned into a cacophony of rattles and overdriven snaps. *Quake*'s rocket explosions fared better, but lacked the authority to loosen any fillings.

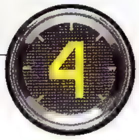
The subwoofer bottoms out easily, forcing you to keep the volume levels from reaching booming levels; while the 120Hz crossover point proved pretty low, as the satellites also receive too much bass when cranked up, causing audible distortion and cone breakup.

The satellites sound surprisingly clear, the high frequencies sounding pleasant and crisp without the need for extra equalization. But they suffer from some imaging deficiencies: instruments are off their proper positioning; and Claire Marlo refused to stand front-and-center, her voice playing loud and clear as distinct left and right channels.

MIDI Land's MLi-S20 Plus could have been a contender, but inferior bass reproduction is its downfall.

boot verdict

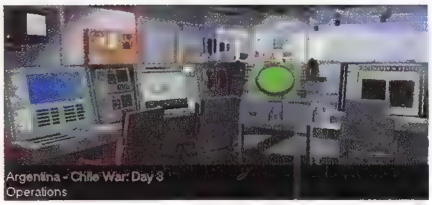
PRODUCT: MIDI Land MLi-S20 Plus
PRICE: $199.95
COMPANY: MIDI Land
PHONE: 909.592.1168
URL: www.midi-land.com



boot KICK ASS! PRODUCT

Jet Fighter III

A class act in every department



The Ops Room aboard your "virtual carrier"—go here to get mission briefings and debriefings in *Jet Fighter III.*

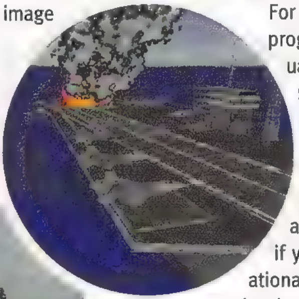
By focusing on only two aircraft (the F-22 and the FA-18), the relatively small Mission Studios have left themselves plenty of programming room in *Jet Fighter III* to give both aircraft the deluxe treatment and, in the process, give their bigger competitors something to worry about.

Instead of a quick briefing and a standardized takeoff routine, players operate from a "virtual aircraft carrier." Log in your name and call sign, and you're assigned a cabin, where you can check e-mail from comrades, scan the latest campaign reports, and keep tabs on your performance record. In the ship's library, you can access more than 500 pages of technical data, expert commentary, and photographs.

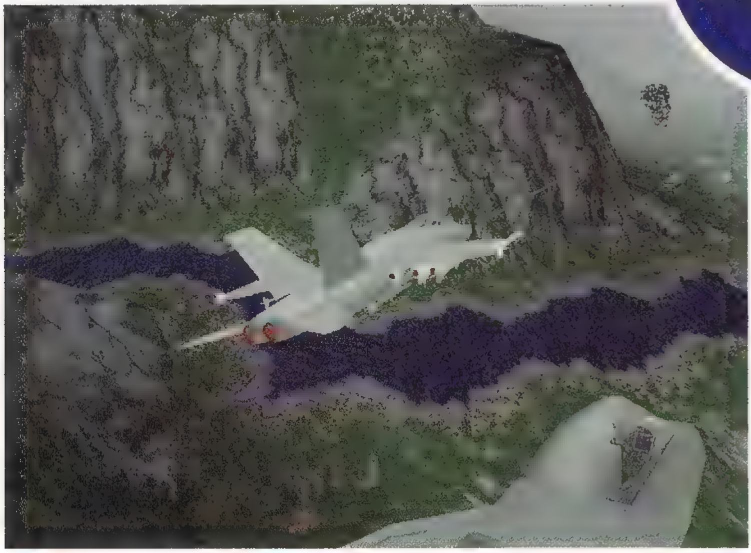
On the hangar deck, you can fine-tune weapons' loadouts and even customize your unit's insignia. Carrier operations proceed realistically around you at all times, complete with elaborate sound effects; the ship pitching and rolling in high seas; hair-raising landings and takeoffs; and meticulously modeled flight deck blast deflectors.

All 90 missions are flown in campaigns, covering three hypothetical conflict areas: Cuba, Chile, and Argentina, which are detailed, plausible, and gripping. Aside from lending an unusual realism to the game, the theaters provide an eye-popping range of spectacular scenery: towering mountain ranges, rugged coastlines, deserts, and photorealistic cities, all scrupulously modeled from D.O.D. and Defense Mapping Agency data bases. All told, you can fly over 3.5 million square miles of real-world terrain.

Terrain rendering makes full use of a new graphics technology called 3DNA Sequencing (Dynamic Nexus Architecture); fractal prediction is used to enhance texturing and provides a remarkably clear image with scarcely a trace of warping. A complementing technology called Textureal uses image-specific data to match edge textures without loss of detail or mirrored pattern effects. This translates into some of the most gorgeous graphics ever to grace a flight simulator.



Your carrier under duress—looks like somebody didn't do a good job of protecting the ship...



Dogfighting in the valleys of the Andes—a typical view of the gorgeous terrain featured in *Jet Fighter III.*

JF III is also very hardware-friendly. If you're running it on a 486/66 or a low-end Pentium, you can adjust screen size, horizon visibility, and resolution to optimize frame rate (the lowest res mode runs about 225 percent faster than the highest) with minimal loss of graphics quality. One word of caution: Run *JF III* in DOS. Even though the program will run in Win95, there are sound card problems (which Mission Studios is working to solve), and the sound is just too good to miss.

For all the fancy technology packed into the program, it's mighty easy to learn—the manual is first rate, the fine-tuning options really work, and the interface is a paradigm of good design.

Even a novice sim pilot will appreciate how sweetly the aircraft respond and how well-integrated the combat missions are into the general learning curve. And if you feel like a little off-the-record recreational flying, there's a handy Free Flight mode that lets you see the sights and savor the beautifully rendered terrain without worrying about a missile suddenly committing an unnatural act on your airplane.

Just as the previous two *Jet Fighter* products encapsulated "state of the art" for their respective technological eras, *Jet Fighter III* strikes the same elusive balance between realism and raw, addictive playability.

— *William Trotter*

boot verdict

PRICE: $59.95
DEVELOPER: Mission Studios
PUBLISHER: Interplay
PHONE: 800.468.3775
URL: www.interplay.com

9

Mission Studios

A case study in pushing envelopes

The main thrust of the *Jet Fighter* series has always been, in the words of Producer/Director Matt Harmon, "to push the technology, not for its own sake, but to increase the playability of the games." A quick look back, then, at the evolution of these sims:

It all began in 1987, when chief programmer Bob Dinnerman produced *FA-18 Interceptor* for the Amiga. Mission Studios was then called Velocity, and the game was published by Electronic Arts. At the time, it was considered, hands down, the best flight sim available for that platform.

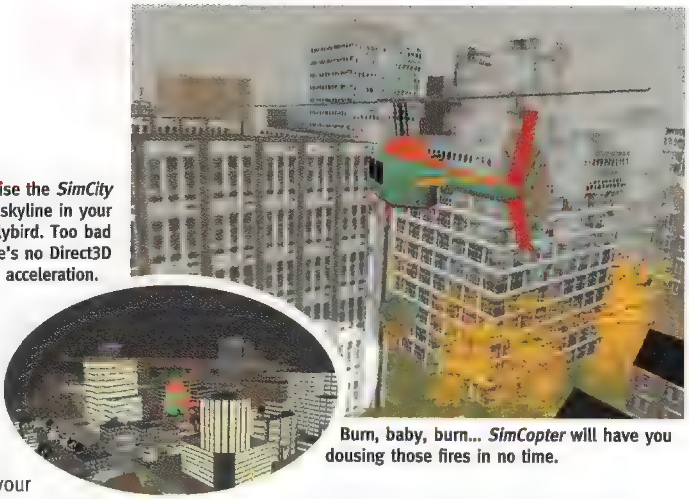
One year later, *Jet Fighter I* came out on the PC. It pushed the envelope, even though it only ran in 16-color EGA, at a speed of about 8MHz. Harmon remembers having to buy a $500 EGA board just to run the game on a 286!

In 1991, *Jet Fighter II* broke the "PC ceiling" with its 256-color VGA graphics, faceted polygons, primitive light sourcing, and, for the first time, a graduated horizon! How little it took, in those days, to set a new standard—the product shipped on two low-density 3.5 floppies, containing about 1.2MB of code.

In *Jet Fighter III*, the scenery alone required 400MB of code! We've come a long way indeed, in 10 short years.

SimCopter

Your eye in the sky



Cruise the *SimCity* skyline in your whirlybird. Too bad there's no Direct3D acceleration.

Burn, baby, burn... *SimCopter* will have you dousing those fires in no time.

Anyone who's ever sweated the details of molding a *SimCity* from the first foundations to a thriving metropolis knows what it's like. You desperately want to get inside your city; see it from every angle; make sure it works from the ground up. Well, the latest sim from Maxis gives you that opportunity... from a bird's-eye perspective.

Hop into the cockpit of *SimCopter*, load up your own personal burg or metropolis, and take to the sky, hovering between skyscrapers, jetting up the face of mighty waterfalls—even putting your bird down and walking among the previously anonymous sims that occupy your urban utopia; all in glorious 3D. Only the 3D ain't so glorious. In fact, it's a real letdown.

The polygon graphics are crude and animation is choppy even on the fastest of systems. Up close, your sims look as though they emigrated from an Atari 2600. There are tons of options to shutdown effects and turn up the haze that masks distant polygon generation, but these only create a claustrophobic effect. The 256-color palette paints your world in murky tones. Given the sharp 2D sprites and bright palettes of *SimCity*, this is particularly disappointing.

The premise behind the gameplay is solid. You commandeer a whirlybird performing civilian operations in one of your own cities or one of those provided with the game. A series of 30 cities are included with the game as a sort of career mode. Complete them all and you'll be rewarded with a gaggle of men in Speedos making out—although later versions of the game have stripped this code out, replacing it with a brass band celebration.

Control in the game is stultifying. Given the meticulous flight models employed by the bevy of military helicopter sims, *SimCopter*'s crude controls are frustrating at best.

Like any fan of *SimCity*, you've gotta want to like this game, given its awesome premise. Alas, with the poor graphics and stiff control, that's just not possible. — *Brad Dosland*

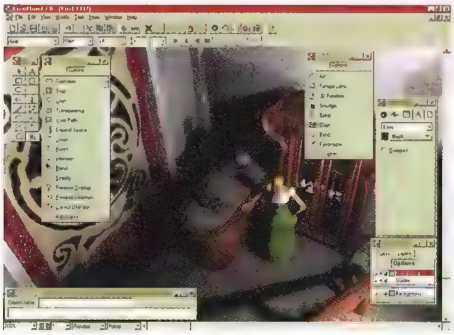
boot verdict

PRICE: $49.95
DEVELOPER: Maxis
PUBLISHER: Maxis
PHONE: 800.336.2947
URL: www.maxis.com

5

FreeHand 7

A leap of faith



A multitude of floating windows cramps your workspace. *FreeHand* assumes you have a 21-inch monitor!

For *FreeHand* to make the leap from version 5 straight to version 7, completely skipping version 6, you'd imagine this must be a pretty darn extensive upgrade. Guess again.

Aside from modest cosmetic changes and the incorporation of Macromedia's Shockwave technology, this latest version's smattering of new tools doesn't even seem to warrant a single number jump. This version should probably be 5.5 (but then people might think *Illustrator* was more powerful, since it's at version 6).

But that's not to say that what is here isn't good. In fact, if you're looking for a one-stop, compatibility guaranteed graphics solution, you can't go wrong with the *FreeHand Graphic Studio* bundle. This suite brings together *FreeHand 7* with *Xres 3.0, Extreme 3D 2.0,* and *Fontographer 4.1* for less than $500 (and at only $50 more than *FreeHand* alone, this is the way to go). This group of capable solutions should satisfy most anyone's graphics-related needs.

Of the changes, perhaps the most enticing is the ability to use *FreeHand*'s vector-based images on the web as Shockwave graphics. These images' small file size (due to equation-based line descriptions, as opposed to grid-based images such as traditional GIFs and JPEGs) and innate ability to create effective image maps by linking portions of an image to various URLs, make *FreeHand* a natural for ambitious web designers.

As a gift from its Macromedia kin, *Director*, this version of *FreeHand* has the ability to use Xtra extensions to extend its abilities. Among those included is one that allows the program to take advantage of *some* of the plug-ins for Adobe's *Photoshop* (although, in our testing, fewer than half actually worked as intended). *FreeHand* can import and export a broad array of file formats, including *Illustrator* files, as editable paths; and other formats, such as EPS, GIF, BMP, and JPEG can be imported as TIFF files.

The new version of *FreeHand* follows the trend of assuming everyone has screen real estate to burn and places many of its most useful (and frequently accessed tools) on floating palettes to clutter the screen.

Still, with the handful of new tools (including more powerful blend capabilities, Macromedia's script engine, and a new anchor point for smoothly connecting straight and curved lines) added to the already capable program, *FreeHand* should satisfy the needs of most artists who've taken the time to master the arcane art of Bézier curves.

— *Brad Dosland*

boot verdict

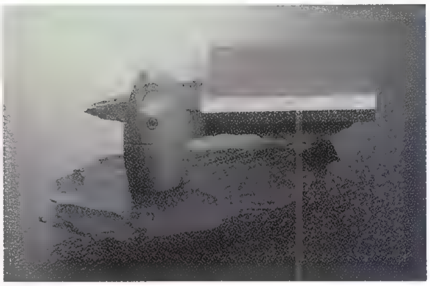
PRICE: $399
DEVELOPER: Macromedia
PUBLISHER: Macromedia
PHONE: 800.326.2128
URL: www.macromedia.com

7

H/W

Sony VisionTouch

Remote control sex appeal in a box



It may look delicious, but skip the Air-EGG appetizer and devour the programming power of the CAV-10 IR interface box.

Sony's two VisionTouch remote control systems promise remote control sex appeal. The first, the CAV-1, comes in a sleek charcoal housing and uses the Air-EGG controller like a wireless mouse. The system also acts as a programmable IR conduit between all the remote controlled devices in your household, via the powerful CAV-10 interface box. The second, the CAV-2, consists of only the CAV-10 interface box, sans Air-EGG, but both variations ship with the software to get you going.

Utilizing motion-sensing gyroscopes, the Air-EGG two-button wireless remote commander replaces your mouse with a PS/2 connection. But the Air-EGG is a disappointing experience, with cursor movement alternating between erratic and uncontrollable. Also, the Air-EGG is an uncomfortable beast unfit for small and medium hands; and the spastic motions necessary to maneuver the device will have you feeling anything but sexy. Molded hand grooves would improve ergonomics and render the smooth rounded surface more comfortable.

On the other hand, the CAV-10 interface box is a major success. Simply attach the box to your computer's RS-232 port (cable *not* included) and prepare to take control and program your world. The CAV-10 emits infrared commands to all your A/V devices and the included software turns your PC into Mission Control. The system comes pre-coded for many name-brand devices and we were shooting on/off, fast forward, and volume up commands to VCRs from RCA and JVC, as well as a Sony television straight out of the box. If your A/V gear isn't listed, the CAV-10 can learn new IR codes from your existing remotes. Any Sony CD-changer with a CONTROL A1 mini-jack or Sony VCR/camcorder armed with a LANC jack can even display device information on your computer screen.

And if your control itch still hasn't been scratched, tap the power of macros to unleash a sequence of commands. Imagine a single command that dims the lights, fires up the CD player, sets the volume just where you like it, and then plays your pre-programmed sequence of music from a 100-disc changer. Sweet! Up to five macros, each containing 10 operations, stand ready to serve up remote control bliss.

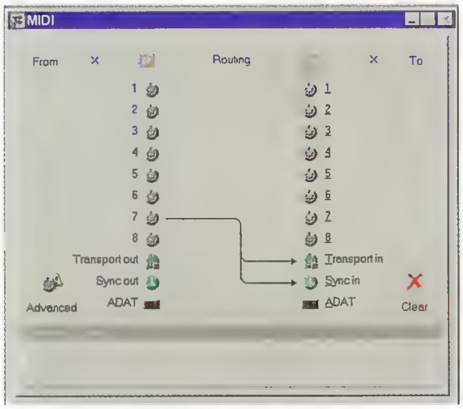
Sexy, ain't it?

Forget the CAV-1, and leave the Air-EGG unhatched. The CAV-2 delivers the Jetsonian programmable prowess you need to be master of your domain. *—Andrew Sanchez*

boot verdict

PRICE: CAV-1 $349.95;
CAV-2 $199.95
COMPANY: Sony
PHONE: 800.222.7669
URL: www.sony.com

6 8
CAV-1 CAV-2



The *MIDI Timepiece AV Console* software lets you set an assortment of synchronization parameters, view incoming SMPTE timecode, and route anything in your MIDI network to anything else in the network.

MIDI Timepiece AV

High-end MIDI mayhem for a song

Keeping your MIDI system in sync with video players or digital audio recorders has traditionally required expensive high-end gear. With Mark of the Unicorn's MIDI Timepiece AV, however, small studios can combine sophisticated MIDI handling features with an array of synchronization capabilities.

The single-rackspace MTP AV is an 8-In/8-Out, multi-port MIDI interface/synchronizer. Its front panel includes an LCD display, four knobs for setting parameters, and two rows of LEDs to indicate MIDI and sync status.

The rear panel provides a parallel port for PCs. If you work in a cross-platform environment you can have both a Mac and a PC connected to the interface and running simultaneously.

The MTP AV includes all the features of the earlier MIDI Timepiece II. Its eight input/output MIDI-port combinations yield 128 independent MIDI channels. A Network port lets you add a second unit for a total of 256 channels. The MTP AV can route any input to any output, merge any inputs to any output, mute incoming data at any input, and re-channel on input and output. You can also store up to 128 different Setups and recall them with MIDI Patch Change messages from a sequencer or controller.

The MTP AV's synchronization capabilities go far beyond other MIDI interfaces. It not only converts all frame rates of SMPTE timecode to MIDI timecode (MTC), but it also supports digital audio word clock synchronization in both the standard format and Digidesign's "Superclock" format (for use with various Pro Tools systems). Furthermore, the MTP AV genlocks to video or black-burst and converts to SMPTE, MTC, and word clock. Its internal clock is also available as a sync source.

If you're using an Alesis ADAT multitrack recorder, an ADAT Sync Out port synchronizes one or more ADATs to the above sources. And thanks to the MTP AV's support of MIDI Machine Control you can operate the ADAT's transport functions from your sequencer program.

Other features include: Jam Sync capability to regenerate fresh timecode when copying tapes; adjustable Freewheeling to compensate for timecode with dropouts; and two pedal inputs for sending MIDI data through your system and for converting an audio tempo source (such as a click or drum beat) into MIDI data so you can slave your hardware and software to it.

The MIDI Timepiece AV offers big-league features for a surprisingly modest price. If you produce soundtracks with your PC, this little black box can keep everything marching along in step. *— David M. Rubin*

boot verdict

PRICE: $595
PRODUCT: MIDI Timepiece AV
COMPANY: Mark of the Unicorn
PHONE: 617.576.2760
URL: www.motu.com

9

H/W

Force FX

Obi-Wan would be proud

If you're looking for an intense, immersive gaming experience, check out CH Products' Force FX, the planet's first (consumer) force-feedback joystick. It'll knock your socks off.

The Force FX is modeled after CH's F-16 Combatstick (both use an identical fiberglass, plastic-filled handle), but an autopsy of the guts reveals the Force FX to be an entirely different breed. Two components make this stick unique: a printed circuitboard and a motor board. The PC board handles game commands received through the host PC's serial port. The motor board amplifies these signals and converts them to affect the speed and direction of the actual motors providing the various effects (such as jolts, vibrations, buffeting, and recoil), which are linked to various actions in the game.

The Force FX features eight buttons, including two four-way hatswitches, a trigger, and trim controls for both the X and Y. Each fire button is rated for more than 10 million hits, and each hat direction is rated for over 2 million hits. The ergonomic handle is modeled after a stick in an actual F-16 Falcon jet, so if you have small hands, the Force FX might be a trifle uncomfortable to use (the upper-left fire button can be a bear to reach).

With a weight of more than four pounds, you won't want to drop the Force FX on your foot.

Installation is simple (Win95 DirectInput drivers are included), but if you want to experience the cool effects, you'll need to use a serial port in addition to your game port.

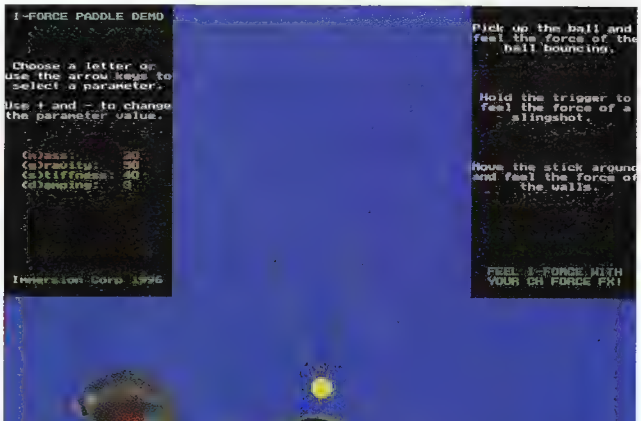
The Force FX performed admirably in the four games we tested: *Descent II*, *The Need for Speed Gold SE*, *Warbirds*, and *Jet Fighter III*. Since each effect can be assigned to either axis—or combined to create new sensations—each game plays and feels different. Squeezing off a few rounds in *Warbirds* or *Descent II* for example, results in the trigger button shuddering and recoiling as if you had fired a gun. But slam head-first into an outer wall in *The Need for Speed Gold SE* or pull a tight spin in *Jet Fighter III*, and you'll struggle valiantly to keep control. (Don't worry racing fans, CH Products promises a force-feedback steering wheel later this year.)

Games must include direct support for the I-Force force-feedback API to take full advantage of the stick. Even without API support, you can run a special utility that lets you assign jolts (but not other forces) to any of the fire buttons. The Force FX is also backward compatible with games supporting the F-16 Combatstick.

Not many games currently take full advantage of the Force FX—at press time there were less than 10—but CH Products promises more compatible games in the future. Once developers discover force feedback can enhance gameplay, chances are they'll be more than willing to include support.

The Force FX weighs a hefty four pounds. With its massive footprint and three cables snaking across your computer (for the serial, game port, and power connections), you'll need to make room both on and *around* your desktop. May the force be with you.

— Bryan Del Rizzo



I-FORCE PADDLE DEMO

Choose a letter or use the arrow keys to select a parameter.

Use + and - to change the parameter value.

(m)ass: 20
(g)ravity: 50
(s)tiffness: 40
(d)amping: 8

Immersion Corp 1996

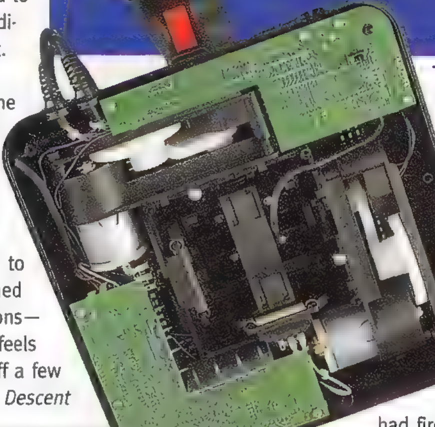
Pick up the ball and feel the force of the ball bouncing.

Hold the trigger to feel the force of a slingshot.

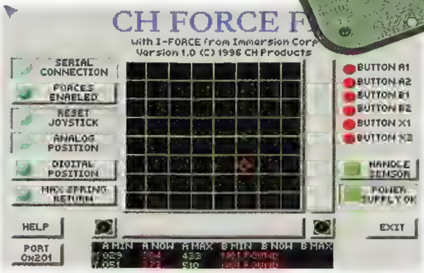
Move the stick around and feel the force of the walls.

FEEL I-FORCE WITH YOUR CH FORCE FX!

This simple slingshot demo does a great job of showing off force-feedback technology.



Crack open the bottom of the stick, and you'll see the forces are produced by a simple combination of gears and motors.



CH FORCE FX
with I-FORCE from Immersion Corp
Version 1.0 (C) 1996 CH Products

Use the *FXTest* utility to check the status, modify the settings, or recalibrate the Force FX.

Games Currently Available

- Descent II
- Jet Fighter III
- Unnecessary Roughness '96
- Warbirds
- Flying Nightmares 2
- The Need for Speed Gold SE
- Silent Thunder
- Fighter Duel SE
- Monday Night Football

Coming Soon

- Outlaws
- Rocket Jockey
- Mag Zone
- Air Warrior II
- Confirmed Kill
- AH-64A
- Red Baron 2

boot verdict

PRICE: $249.95
COMPANY: CH Products
PHONE: 619.598.2518
URL: www.chproducts.com

9

S/W

Destruction Derby 2

Stop me before I crash again

Houston, we have liftoff—about 500 feet of liftoff.

Want to piss me off? Plunge me into a game where my enemies are free to handicap me so I can't retaliate. While you're at it, throw salt on my wounds with an annoying announcer shouting superlatives. Then slap me in the face by making it a sequel to one of my favorite mindless pastimes. *Destruction Derby 2* is just such a game.

The original *DD* was begging for a network multiplayer option. *DD2* advertises multiplayer support on the box, but this bogus BS turned out to be an option where several players' times are ranked together. Someone ought to be shot for taking the multiplayer name in vain.

DD2 screws up the over-the-top destruction of the original by trying to make it into a serious racing game. It adds a real-time 3D physics engine, although the developer must have used the wrong gravitational constant because the slightest bump sent me flying around like Chitty-Chitty-Bang-Bang through most of the game. In fact, the whole bootStaff was amazed at the five minute hang time I got in the Red Pike Arena. After floating several hundred feet in the air and crashing to the ground, my car suffered no damage. Ridiculous. This is indicative of the general lack of control that plagues the game.

Destruction Derby 2 runs in low res (320x200 256 colors) and high res (640x480 256 colors) modes, and with Matrox's Mystique accelerator, frame rates creep up into the acceptable realm and colors flesh out 32k. To its credit, *DD2* did incorporate some much-needed 3D elements, with more complex models and full Gouraud shading in the Mystique version; but it certainly isn't as breathtaking as, say, *Tomb Raider* on a Rendition Vérité. Even though the polygon counts run up to the thousands, the frame rate blows. And what's up with the triangles that fly confetti-like in every collision, making you think you just knocked off a fractal instead of a fender?

Couldn't someone have stopped during the development of this game and said, "Let's just make a game where cars smash into each other, make it networkable, and maybe enhance it with 3D elements"? That kind of game would never piss me off. — *Sean Downey*

Destruction Derby 2 **comes with the Matrox Mystique, which is probably the only reason you should ever own this game.**

boot verdict

PRICE: $49.99
DEVELOPER: Reflections
PUBLISHER: Psygnosis
PHONE: 800.438.7794
URL: www.psygnosis.com

3

H/W

Sony's Multiscan 200sf is a good all-around monitor.

Sony Multiscan 200sf

Not exciting, but solid...

The Sony Multiscan 200sf is a good monitor that falls just short of being great. If it was cheaper, it would be an excellent value; if it had more features and supported 1600x1200, it would be an excellent piece of technology. Instead, it falls in between, proving to be a solid, if not very solid, choice.

The 200sf provides simple on-screen controls for adjusting brightness, contrast, screen sizing, centering, pincushion, rotation, and color temperature. It comes pre-configured with nine factory presets, and 10 user modes that can be preserved automatically in memory.

Like all aperture grille monitors, two faint horizontal lines cross the screen of the 200sf and may prove annoying, depending on your tastes. But regardless, the screen is wonderfully bright and sharp, with pure, rich colors and excellent focus. *DisplayMate* revealed a slight red/green misconvergence along the bottom of the screen (more so in the bottom right), but it's almost negligible. Certain background patterns generate Moiré patterns, but they're not severe and are easily avoided. The screen also suffers from some glare, but nothing like the mirror-like glassiness of the Gateway Destination screen.

Sony builds good monitors that will not disappoint, but they are neither value nor technology leaders. For the same price, the Wyse WY17-PS (reviewed on page 92) offers an equivalent picture, more screen adjustments, and support for higher resolutions. But despite the competition, it's hard to find any serious flaws with the 200sf. If you like Sony gear, this screen will serve you well. — *Chris Dunphy*

boot verdict

PRICE: $799.99
COMPANY: Sony
PHONE: 800.352.7669
URL: www.sony.com/technology

6

Tech Specs

Tube	17-inch Trinitron (15.9-inch viewable)
Grille Pitch	0.25mm
Max Res	1280x1024 @ 75Hz
Horizontal Frequencies	30kHz to 80kHz
Vertical Frequencies	50Hz to 120Hz
Case Dimensions (HxWxD)	16x17x18 inches
Weight	42 pounds
Plug-n-Play	Yes; DDC Levels 1, 2B, 2AB, 2B+
Emissions	MPR-II
Power Management	VESA DPMS (130W, 15W, 8W)

H/W

CD-ROAM

Portable drives hit the streets

Tired of going without a floppy drive every time you want to enjoy the CD-ROM experience? Did that featherweight notebook skimp on drives to come in under five pounds? Trying to get a few miles out of that vintage notebook with the 2x CD-ROM drive before running the plastic through for an MMX-based monster? Perhaps a portable CD-ROM drive is what you're looking for.

— Andrew Sanchez

Compare and Contrast

	Sony PRD-650WN	Panasonic KXL-783A	Axonix 10XR
Tested Transfer Rate	354K/sec	724K/sec	1155K/sec
Tested Access Time	281ms	174ms	*195ms
CPU Utilization	37 percent	37 percent	54 percent
579MB File Transfer	11:10	8:26	crashed
WC:IV Load Time	13.5 sec	13.5 sec	crashed
Carrying Weight	1 lb, 9.3 oz	1 lb, 7.8 oz	1 lb, 3.2 oz

(with batteries and no adapter)

* manufacturer's specs

Sony PRD-650WN

Making more with less

In a field filled with 8x and 10x drives boasting blazing transfer rates and blink-of-an-eye access times, how can a mere 6x drive, with an average access time of some 280ms, one that delivers less than half its claimed 900K/sec transfer rate, one that slips down to quad speeds unless juiced by the AC adapter, possibly compete?

If it's the Sony PRD-650WN, it does so by being the *only* drive in our tests to deliver flawless cinematics from our *Wing Commander IV* tests.

The PRD-650WN also packs some cool features, such as an ultralight carrying weight and a super-thin profile, measuring 2.25-inches high. Batteries slide into an adapter that comes as a separate plate that mounts underneath the drive. An Adaptec PCMCIA 2.1 SCSI card tethers the PRD-650WN to your notebook. Optional SCSI cables are available for interfacing with your desktop SCSI adapter. In terms of audio, built-in Bass-Booster equalization shores up any low-end audio deficiencies, and while the PRD-650WN doesn't come with built-in speakers, it does come with excellent Sony headphones.

boot verdict

PRICE: $399
COMPANY: Sony Information Technologies
PHONE: 800.352.7669
URL: www.sony.com/technology

8

Panasonic KXL-783A

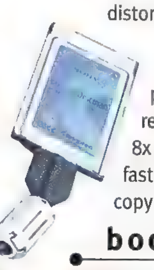
Well, isn't that spatial?

The KXL-783A 8x CD-ROM drive, Panasonic's latest portable, comes packed in a sturdy case and ready to rock. While only mustering a little over half the touted transfer rates of 1200K/sec, the meaty 128K cache delivers nearly the entire 180ms access time.

Installation is painless. Simply plug the included PCMCIA 2.1 interface card into your notebook's PC card slot and you're running. A standard half-pitch 50-pin SCSI-2 connector allows you to hook up with any SCSI-equipped desktop system, and drivers for almost every OS come with the drive.

Spatializer circuitry included with the drive attempts to create "bigger" sound, even from the pair of tiny 0.75x1.25-inch speakers built into the drive's case. This effect works better with audio CDs than games, adding echo to widen the sound stage, but generates harsh midrange distortion when cranked up.

In our real-world testing, *WC:IV*'s SVGA cinematics suffered visual choppiness throughout, although the audio remained stutter-free. The KXL-783A's 8x performance turned in the fastest times in our massive file copying test.



boot verdict

PRICE: $399
COMPANY: Panasonic Computer Peripheral Company
PHONE: 800.742.8086
URL: www.panasonic.com

7

Axonix ProMedia 10XR

Unsafe at any speed

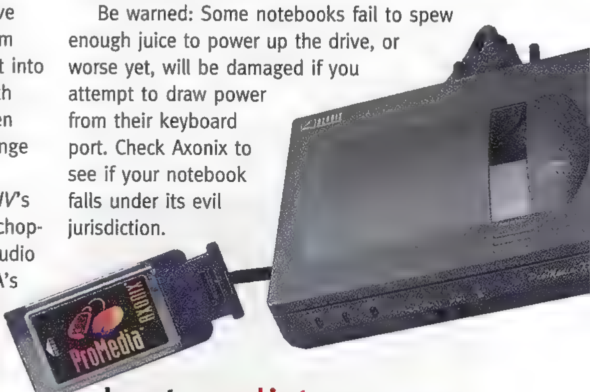
With transfer rates higher than 1000K/sec and claims of access times in the 195ms range, speed is not the ProMedia 10XR CD-ROM drive's problem. It's like a 128K cache sports car running at 10x speeds, where acceleration has been cranked... at the expense of steering and brakes. And the bulky drive's flimsy plastic housing won't make you feel any safer about taking it out on the road.

When not hooked up to the notebook's PC-card interface, the ProMedia 10XR forsakes SCSI and goes the parallel port route, allowing it to run on a wider range of computers; but watch out for some serious data transfer bottlenecks, due to the parallel port's transfer rate constraints.

The ProMedia 10XR's PCMCIA adapter behaves like a standard EIDE controller and Win95 installs the appropriate drivers. Unfortunately, the ProMedia 10XR isn't ready for prime time; the drive failed half of our tests. It refused to run *WC:IV* and choked on the access time test—repeatedly crashing our notebook.

When you take this act on the road, don't bother looking for a battery compartment. There isn't one. And the AC adapter is optional equipment, so you'll have to fire up the ProMedia 10XR by plugging an adapter into your notebook's keyboard port.

Be warned: Some notebooks fail to spew enough juice to power up the drive, or worse yet, will be damaged if you attempt to draw power from their keyboard port. Check Axonix to see if your notebook falls under its evil jurisdiction.



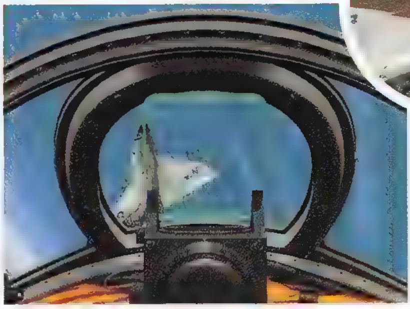
boot verdict

PRICE: $429
COMPANY: Axonix Corp.
PHONE: 800.866.9797
URL: www.axonix.com

3

US Navy **Fighters '97**

Jane's tours 'Nam in style



US Navy Fighters '97 offers all the realism and aerial thrills you'd expect from a Jane's sim.

USNF '97 features four new planes and includes a full Vietnam campaign.

Besides packing in all the missions and aircraft from both the original *USNF* and *US Marine Fighters*, *US Navy Fighters '97* also includes a full Vietnam campaign (and stand-alone missions from that era) featuring four new planes: the F-8 Crusader, the F-4 Phantom, the MiG-17, and the MiG-21.

In the late '60s, many "experts" predicted that the day of the cannon-only dogfight was over; that missiles alone would do the job. Nobody bothered to tell that to the North Vietnamese (or whoever was flying their best planes), who simply ignored the missiles, closed in, and proved to be daunting at dogfighting. Statistics show that only about five percent of American air-to-air missiles actually hit their targets!

The fighting over Hanoi came to resemble the mêlées of WWII, and this close-range, twisty, turny combat is dramatically recreated in this simulation. So is the incredible density and fury of the AAA fire that American pilots had to brave on every mission north of the DMZ.

Neither the flight performance nor the graphics have changed significantly from the original—and that ain't bad. Capable of a system-stopping 1024x768 resolution at 256 colors, if the SVGA ground terrain is not as lush, detailed, or richly textured as it is in, say, *Jet Fighter III*, it's still *very* good. And the cloud/hazing/horizon graphics are first rate. Performance remained as hard-assed as ever, bringing even the mightiest of systems to its knees. With every detail turned on, frame rate may bog down as low as 4fps—especially when flying over the Vietnam map with multiple 300 polygon-count bogies hunting you.

There are some significant improvements in *USNF '97*. For one thing, it runs—quite well—under Win95. Plus, this sequel adds head-to-head combat (two to eight players) over network or modem; a feature which adds a whole new dimension to the original campaigns.

The marvelously complete Jane's Reference Guide has been expanded to include 35 minutes of excellent FMV footage, much of it quite stirring. You also get a generous helping of still photos, drawings, and technical data. And, as was previously the case, the manual is superb: clear, complete, and logically laid out.

Even if you own *USNF* and *US Marine Fighters*, the head-to-head mode alone makes *USNF '97* an attractive investment. The gripping Vietnam campaign by itself is worth the asking price. And if you've not played a Jane's sim before, you're in for a treat—these planes fly with a grace, stability, and realism that make them ideal toys for both expert and novice joystick jockeys.

— *William Trotter*

boot verdict

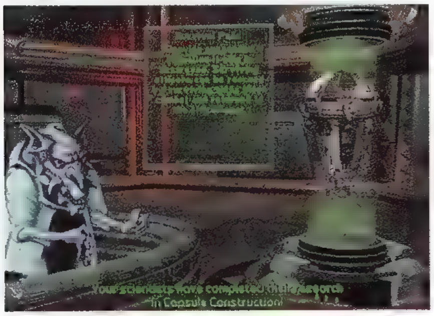
PRICE: $54.97
DEVELOPER: Jane's Combat Simulations
PUBLISHER: ElectronicArts
PHONE: 800.245.4252
URL: www.ea.com

9

Master of Orion II

Postcard from the edge

Great news—I was elected to city hall! Upon taking office, I quickly built low-cost housing developments and farms to feed the workers. Our humble town soon grew into a massive city. Problem was, there wasn't enough room for all the new immigrants. I told my researchers to construct ships for finding other planets to colonize. Soon I was elected Emperor of the galaxy.



Your scientists have completed their research in Capsule Construction!

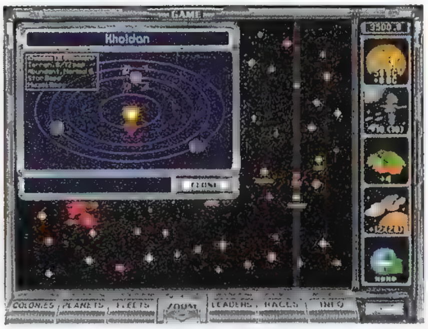
Research and technology are important for maintaining your galactic supremacy in *Master of Orion II*.

Life was good until rumors surfaced of other intelligent life. I turned to an old scryer who consulted an ancient text called the *Master of Orion II* manual. He foretold of encounters with up to 13 alien races, and said that to become a true leader, I would have to manage and develop plans for technology, diplomacy, and combat.

I hoped the aliens would be friendly and good trading partners, but I also feared for the lives of my colonists. Right then, I decided to spend additional money on research to improve our ships, shields, and warp drives, as well as personal armor and weapons.

But unlike my predecessors, my responsibilities are more complex. I have clearance to build unlimited ships (my predecessors could build only five), and I'm in control of strategic colonization and tactical combat, including weapons, ship movements, shuttle and missile launches.

The 640x480 universe is bathed in beautiful 256 colored light, and the air is rich with 16-bit music and digital sound effects. Many of the sprite-based inhabitants and scenery have been hand drawn and then animated.



Choose your prey from the Tactical Center.

Work is tough, and I've requested additional help. If you know anyone who wants to be mayor, tell them to book passage to MoO2 pronto (up to eight positions are simultaneously available). Job responsibilities and conquests can be completed in as little as eight hours or more than 100.

— *Brad Craig*

boot verdict

PRICE: $49.95
DEVELOPER: Sim Tex Software
PUBLISHER: MicroProse
PHONE: 800.695.4263
URL: www.microprose.com

8

H/W

F-22 Pro, X Fighter and Top Gun

Take to the skies

X-Fighter's solid base and firm handle make it an ideal stick for novice flyers.

ThrustMaster has three new flight joysticks designed to get you into the skies: Top Gun, X Fighter, and the F-22 Pro. Top Gun and X Fighter are ideal for beginners, while the F-22 Pro is more costly and is geared toward the advanced flight jockey.

The F-22 Pro is an intense-looking stick with a weighted, metal base to keep it secured to your desktop. And with a total weight of four pounds, the F-22 Pro is also one of the heaviest sticks on the market. It is solidly constructed, and features a zinc-plated metal gimbals system for durability (the handle is comprised of 10 percent glass and 90 percent plastic). The F-22 Pro features four fire-buttons and four four-way hatswitches, which are programmable in both digital and analog modes.

The game control sets are really just detailed text files. For example, programming a button to repeat an A,B keystroke sequence results in BTN S1 (RPT(7)(ab)). The interface isn't intuitive. Thankfully, pre-defined program sets can be downloaded directly from ThrustMaster's web site, lessening the pain and frustration.

The F-22 Pro joystick is at the top of the class in price, but not performance.

Installation is relatively simple, but the F-22 Pro requires a keyboard pass-through connection (you plug your keyboard into the base unit of the F-22). You'll get a great workout after a couple of hours of flying, but the heavy-duty springs will eventually wear you down.

The X Fighter joystick may weigh less, but it's just as stable during gameplay. This stick has a more comfortable handle, and felt great during heated battle. The handle is modeled after a B-8, and features geared potentiometers for precision control. The X Fighter has a four-way hatswitch, three buttons, and an action trigger. The stick performed well in *Privateer 2*, making the difference between life and death.

Top Gun is a modified improvement of ThrustMaster's Mach 2, and features a four-way hatswitch, three beveled buttons, and an action trigger. The handle is modeled after the grip controller in the F-4 Phantom fighter jet, and is designed for virgin fliers who want the thrill of flight without spending big bucks. Top Gun is smaller in comparison to the X Fighter and its big brother the F-22 Pro, but handles just as well.

If you like playing with a stiff stick (with lots of tension), have the money to burn, and have a programming degree, the F-22 Pro should suit you just fine. If you're a casual flier, the X Fighter is recommended because of its great balance between price and functionality. Top Gun is strictly for beginners.

— *Brad Craig*

boot verdict

PRODUCT: F-22 Pro
PRICE: $219.95
COMPANY: ThrustMaster
PHONE: 503.615.3200
URL: www.thrustmaster.com

7

boot verdict

PRODUCT: X Fighter
PRICE: $59.95
COMPANY: ThrustMaster
PHONE: 503.615.3200
URL: www.thrustmaster.com

8

boot verdict

PRODUCT: Top Gun
PRICE: $49.95
COMPANY: ThrustMaster
PHONE: 503.615.3200
URL: www.thrustmaster.com

6

Top Gun is smaller than the F-22 Pro and the X-Fighter, and is a good stick for its price.

For Rocket Scientists Only

Programming the F-22 Pro can be a real adventure. This stick stores information to the internal EEPROM, so once you've downloaded a game setting, it will remain there until you clear it to play a different game.

Programming is completed by assigning various game and keyboard commands to the individual buttons. Macros can be assigned, but are limited to around 25 keystrokes at one time. You can also print the game control settings and assign labels to the button assignments to keep track of the multiple configurations.

Unfortunately, the programming interface is entirely text based—and compared to the graphical interfaces of competing products, it's frustrating as hell to use, and the learning curve is atrocious. Having the interface designed for DOS and *not* Win95 doesn't help either. ThrustMaster builds good, quality products, but it's clear that they need to spend more money on software development to improve the interface. As it stands, it's just not acceptable.

H/W

WYSEvision **WY-17PS**

With the flick of a switch

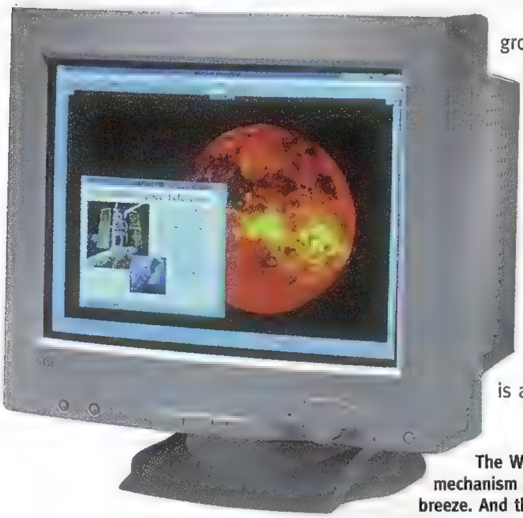
Surely this has happened to you before: You change the resolution or refresh rate on your graphics card, and then fzzbot! You have to spend five minutes retuning the size and centering of the new display just the way you like it. Well, kiss that annoying chore goodbye and say howdy to the new Auto-Picture feature of the WYSEvision WY-17PS.

The innovative one-button (and a dial) mechanism makes for effortless adjustment, and the on-screen menus are quick and easy to use. With a mere flick of the wrist, you can adjust contrast, brightness, sizing, positioning, pincushion, purity, trapezoid, rotation, convergence, and color temperature. In total, there are 20 factory presets, plus there are eight more slots for storing user-defined settings.

The WY-17PS's on-screen image quality is great, with exceptionally bright, true colors. At 1280x1024 resolution, there were no distortion problems and only a tiny convergence problem in the lower-right corner. Focus was sharp as a razor edge to edge. When the monitor was pushed to the extreme realms of 1600x1200, all this beauty began to fuzz over, but only a bit. Note: Like all other aperture grille monitors, the WY-17PS has two faint horizontal shadow lines crossing the screen; these are micro-fine wires that hold the grille in place. Depending on your tastes, this may prove annoying.

The WY-17PS breaks new ground in control simplicity, and is a good value when compared to other high-resolution 17-inch monitors. It would have been nice if it could have done 1600x1200 at more than 60Hz, but at the 1280x1024 resolution, where it is best suited, it truly excels. The Auto-Picture feature should also have been more aggressive about filling the screen to the corners. But regardless of this, the WY-17PS is an excellent find.

— *Chris Dunphy*



The WY-17PS sports a unique button/dial mechanism that makes changing settings a breeze. And the innovative Auto-Picture button makes size adjustments a no-brainer.

Tech Specs

Tube	17-inch DiamondTron (16.2-inch viewable)
Grille Pitch	0.25mm
Max Res	1600x1200 @ 60Hz
Horizontal Frequencies	24kHz to 82kHz
Vertical Frequencies	50Hz to 120Hz
Bandwidth	120MHz
Case Dimensions (HxWxD)	17x16x17 inches
Weight	48 pounds
Plug-n-Play	Yes; DDC Levels 1/2B
Emissions	MPR-II
Power Management	VESA DPMS (130W, 20W, 6W)

boot verdict

9

PRICE: $799
COMPANY: Wyse Technology
PHONE: 800.438.9973
URL: www.wyse.com

Using the Assassin 3D for circle strafing is a great way to eliminate your opponents.

Assassin 3D

To kill or not to kill...

Game controllers have been getting a lot more capable recently, and the Assassin 3D is no exception. First of all, the Assassin 3D is a trackball, not a joystick. Second, it's designed primarily for first-person games such as *Jedi Knight* and *Quake*. And third, it requires *another* joystick (or keyboard) to work.

The Assassin 3D sounds complex, but it isn't. Just plug your joystick into the game port provided on the Assassin 3D controller, and plug your Assassin 3D into the game port/joystick port of your computer. Together, you'll have a unique two-handed solution. Use the Assassin for full 360° viewing (left, right, up, and down), and the joystick for movement, weapons, and assorted game controls.

A micro-controller inside the Assassin monitors trackball, joystick, and button activity up to 10,000 times per second, and digitizes the information to provide faster, more precise control. The movement is very smooth, and more than 100 movement speeds are supported. The Assassin sports three fire buttons, too.

The Assassin 3D trackball is well constructed and comfortable to use, even after several hours of continued game playing. There is a slight learning curve, but once you've mastered control, reverting back to a keyboard or joystick will feel less intuitive. The Assassin 3D is remarkably similar to the Wingman Warrior (both controllers were designed by the same company), but the Assassin has the advantage of being programmable (you can even program the joystick buttons—up to 17 in all), and it doesn't require the use of a serial port.

Currently, the Assassin 3D can only be used with DOS games (or games running in a DOS shell under Win95), but DirectInput drivers and a graphical programming interface will be available early this year.

— *Brad Craig*

boot verdict

8

PRICE: $99.95
COMPANY: First-Person Gaming
PHONE: 888.374.2646
URL: www.fpgaming.com

Battleship and Risk

Classic war games live on

Most of us grew up playing the board game versions of Battleship, Risk, Monopoly, and Scrabble. Fond memories linger of playing Electronic Battleship. Next came a Vic 20, a C64, the Amiga, and then our first 286 Clone. Now we own pure power Pentium gaming machines, but you can still relive childhood triumphs and defeats by playing the next generation of those classic board games.

Battleship

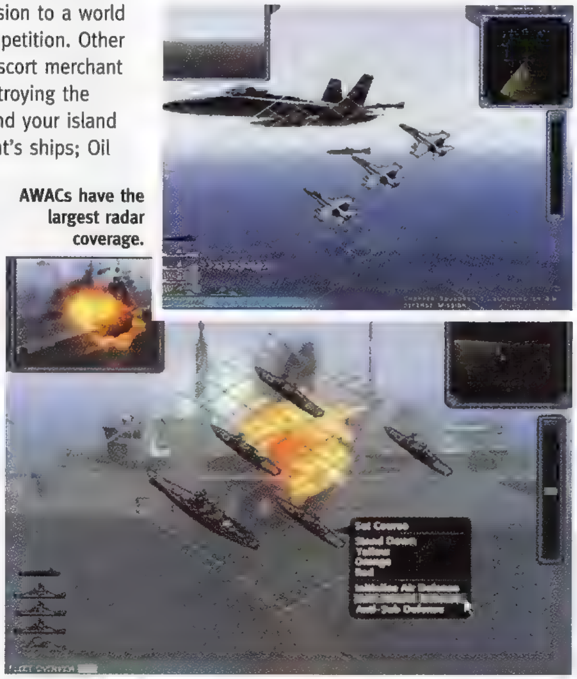
Milton Bradley would be proud

Who would've thought placing red and white pegs in a sea of blue plastic and attempting to sink gray plastic fleets would become a gaming classic? The new PC version of Battleship is a giant leap forward in technology and modern warfare—now you're in command of Alias/Wavefront-rendered ships, submarines, and airplanes. Launch a Tomahawk missile into the belly of your opponent's aircraft carrier, and you'll be greeted by spectacular SGI cinematics of the weapon's launch and hit. There are more than 300 naval, air, and battle sequences throughout the game, all of which played back at 20fps in 640x480 on our test P166.

Battleship also features six modes of play, ranging from a classic practice mission to a world domination, fight-to-the-death competition. Other modes of play include: Convoy—escort merchant conveys across the map while destroying the enemy's to win; Island Hop—defend your island bases while attacking the opponent's ships; Oil Wars—protect your oil rigs and island bases; and Total War—equipped with spy satellites, you can either protect neutral territories or take over your opponent's islands.

Missions are tough, and you'll be stalked by several fleets trying to send you to Davy Jones' locker. The AI improves as you do, and is extremely challenging (for example, it learns which ship will be the biggest threat and tries to take that out first). Up to four players can compete against each other over a LAN, modem, or Mpath. *Battleship* even includes a second player disc.

If you liked the original, you'll find the PC version is a blast to play.

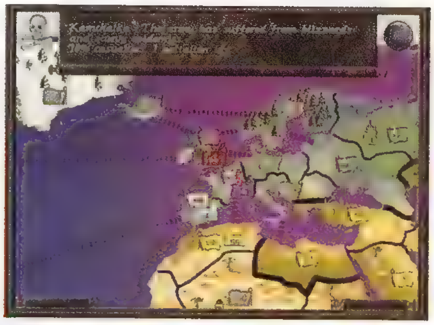


AWACs have the largest radar coverage.

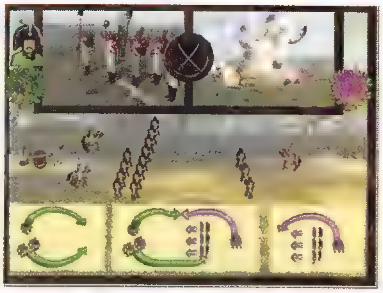
The PC version of *Battleship* kicks butt. The graphics and playability are great; so spread out your fleet and let the cruise missiles fly.

Risk

Everybody wants to rule the world



***Ultimate Risk* allows players to attack until they decide to end the combat phase of their gameplay.**



Choose your attack formation to most-effectively crush your opponent.

Ruling the world has been the dream of every sentient being since time began. And with the PC incarnation of the classic board game Risk, you finally have the chance.

This version of Risk is actually two games in one—*Classic Risk* and *Ultimate Risk*. *Classic Risk* is just like the board game—you place your armies, and commence your global conquest. There's not a lot of skill involved, because your hand of fate is dealt by the computer-rolled dice. You can however, battle against the challenging AI of the computer or with other human opponents directly over a LAN, modem, or Mpath.

Ultimate Risk, on the other hand, includes a host of new options: play the Classic map, a World map (circa 1800), a European map (circa 1792), an Asian map (circa 1800), and the Americas map (circa 1800). Authentic terrains, storms, and pestilence add realism to the game. *Ultimate Risk* is also a lot more challenging than the *Classic* game. The AI's smarter, methodically evaluating the whole scenario to plot strategies against your territories, generals, and troops. And instead of having computer-rolled dice controlling your destiny, you get to pick from the Tactical Card Combat System, which is reminiscent of *Monday Night Football*—you command your troops to run up the middle, run an outside sweep (left or right flank) or tackle (kill off your opponents). After an engagement, you'll be able to trade prisoners, ally with your opposition, and place your troops for the next confrontation.

Risk is Win95 only, and utilizes DirectDraw, DirectPlay, and DirectSound. The game was rendered on an Alias workstation, and features sprite-based graphics. Music and sound effects were recorded at 8-bit, 22kHz, and depending on your machine's horsepower, the video clips play back at about 20fps.

Overall, the game is fun, but the battles lack detail. You'd expect to hear bugles in the background, the thunderous roar of cannon fire, and the smell of musket fire as the guns discharge their loads, but instead, all you get are drumrolls and the quick flash of a repetitious battle scene. As it stands, *Risk* is good, but it's not great.

— *Brad Craig*

boot verdict

PRODUCT: Battleship
PRICE: $39.99
DEVELOPER: NMS Software
PUBLISHER: Hasbro Interactive
PHONE: 508.921.1844
URL: www.hasbro.com

9

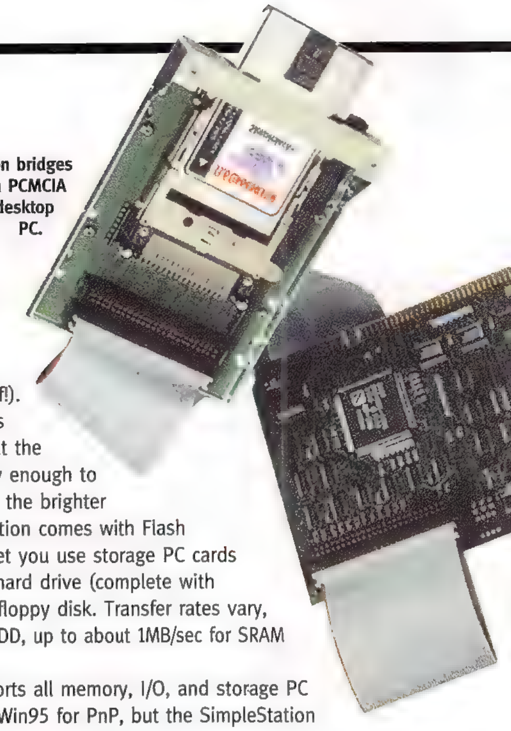
boot verdict

PRODUCT: Risk
PRICE: $39.99
DEVELOPER: NMS Software
PUBLISHER: Hasbro Interactive
PHONE: 508.921.1844
URL: www.hasbro.com

6

SimpleStation

PCMCIA 4 U



The SimpleStation bridges the gap between PCMCIA slots and your desktop PC.

With all the affordable PC cards out there, from ISDN modems to storage cards to network adapters, it's a cryin' shame to limit these tiny workhorses to your notebook PC. If you've invested in a slew of PC cards, go the extra mile and buy an internal PC card drive to port this power to your desktop system.

The SimpleStation is a PnP 16-bit ISA card that connects to a 3.5-inch or 5.25-inch drive bay and upgrades your PC to PCMCIA Release 2.1/JEIDA 4.1 specs. This drive has a double-PC card socket that can handle whatever PC cards you happen to have, from two Type I/II PC cards to one Type I/II and one Type III combo—it even supports one Type IV card in the bottom socket. The SimpleStation supports "hot swapping" and auto-detection allows you to exchange PC cards without rebooting your system.

Format
Option
Exit

SCM MICROSYSTEMS

Utility for formatting of Flash Cards

(c) Copyright by SCM Microsystems 1995-1996

You'll be flashing (your cards) in no time with the included *FTL Format* utility.

Hardware installation is quick and easy, with all the stuff you need to make this drive fit seamlessly into your desktop system: the controller card, ribbon cable, bracket, screws—the whole shebang. Unfortunately, the bulky dual-ribbon cable wouldn't fit behind our CD-ROM drive... no big deal, but it meant keeping the case off the machine (but, then again, the case is always off!).

Installation of the drivers wasn't so simple, wiping out the system's mouse driver. Easy enough to fix, but highly annoying. On the brighter side, though, the SimpleStation comes with Flash File System drivers, which let you use storage PC cards the same way you'd use a hard drive (complete with drive letter designation) or floppy disk. Transfer rates vary, ranging from 200K/sec for HDD, up to about 1MB/sec for SRAM or Flash Cards.

The SimpleStation supports all memory, I/O, and storage PC cards. Of course, you need Win95 for PnP, but the SimpleStation will work for all of you 16-bit partisans running Win 3.x. And, if you have any problems with the SimpleStation, you'll sleep soundly knowing that it comes with a one year warranty.

—Lauren Guzak

boot verdict

PRICE: $160
COMPANY: Simple Technologies
PHONE: 800.367.7330
URL: www.simpletech.com

7

AIGotcha

Delights and disappoints

The AIGotcha is a nifty little video frame grabber that sports some nice features wrapped in a few headaches.

As long as you keep it below 720x480, the AIGotcha has great video quality, but higher resolutions (it supports captures up to 1600x1200) look chunky, as if AIGotcha just delivered larger pixels to take up the space.

The unit can do time-lapse captures automatically, providing a large color preview updated every two seconds, but your resolution settings are not preserved between captures. This makes it impossible to use the feature at anything other than the minimum resolution of 360x240.

Not all the features come with caveats. The AIGotcha is TWAIN compliant, so you can bring up the capture window directly in many image editing programs, such as *Photoshop*. It supports: BMP, TIFF, PCX, PICT, GIF, Targa, and JPEG file formats; both composite and S-Video input; as well as video pass through. And using it is simplicity itself.

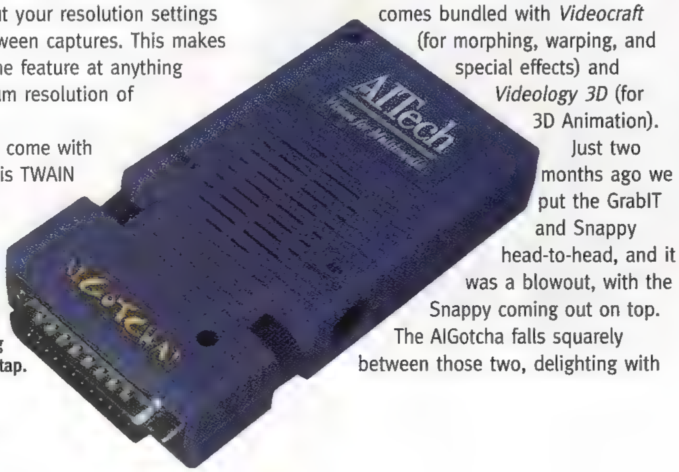
Despite this, maddening little details abound.

Annoyingly, the unit draws power via a cable that taps your keyboard port—you plug the tap into your computer, and your keyboard into the tap. But on my machine, the wire coming out of the tap blocked the mouse port, making it nearly impossible to plug the mouse back in.

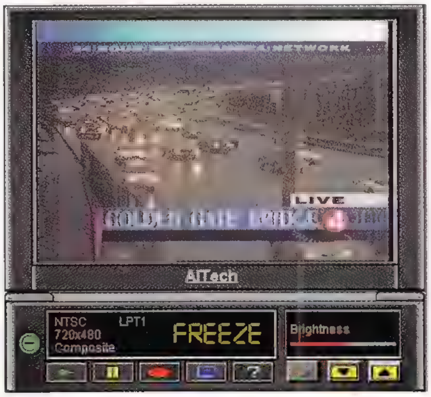
Amazingly (for a program released in 1997) the AIGotcha capture software is not Win95-native. Thus, it does not recognize long file names and there's no handy uninstaller. It also comes bundled with *Videocraft* (for morphing, warping, and special effects) and *Videology 3D* (for 3D Animation).

Just two months ago we put the GrabIT and Snappy head-to-head, and it was a blowout, with the Snappy coming out on top. The AIGotcha falls squarely between those two, delighting with nifty features that the Snappy lacks, such as the time-lapse capture, but maddening as well, with some serious interface glitches. Visual quality at lower resolutions is comparable to the Snappy, but the AIGotcha's high-res captures leave a lot to be desired.

— Chris Dunphy



The AIGotcha looks like a near twin of the GrabIT reviewed in *boot* 05, including the annoying keyboard power tap.



AIGotcha is a TWAIN-compliant capture device, enabling it to be used easily from within many image-editing programs. Notice, though, the chunky pixels in the 1600x1200 capture.

boot verdict

PRICE: $169
COMPANY: AITech
PHONE: 800.882.8184
URL: www.aitech.com

6

IMS TwinTurbo and Hercules Dynamite 128-Bit Accelerators

Giving 2D a bad name

Reports of the death of the 2D-only card have been greatly exaggerated. Sure, all eyes are currently on 3D accelerators, but there are still plenty of worthwhile 2D cards coming out. And if what you really need is to work in skyscraper-high resolutions and subterranean color depths, a high-end 2D card far exceeds most of today's hybrids. Yes, there are reasons to consider a 2D-only card. Unfortunately, there are few reasons to consider either the TwinTurbo or the Dynamite.

— Chris Dunphy

IMS TwinTurbo 128P

Sony chose to bundle the TwinTurbo 128P with its new W900 24-inch monitor, so you'd expect the card to be good. And it is... for some things; in other areas however, this card is sorely lacking.

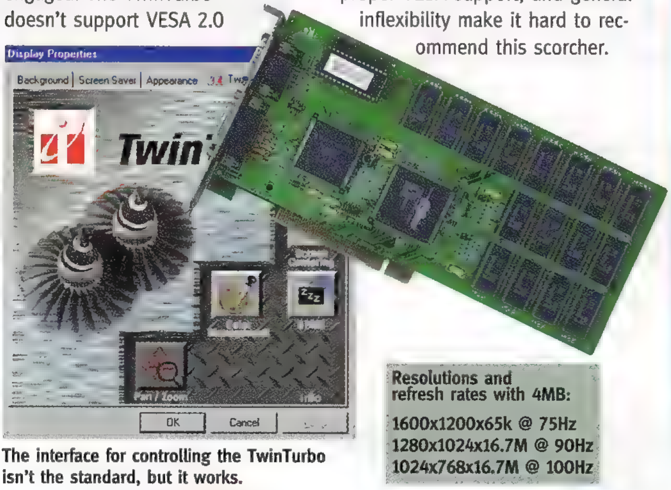
The TwinTurbo runs off an IMS-designed graphics processor coupled with 2MB to 8MB of VRAM and a 220MHz RAMDAC that delivers blistering fast Windows performance all the way up to 1600x1200.

But this card sucks when it comes to DOS apps.

Installation was a total pain. We had to remove the sound card and tweak extensively to get the system to boot with the IMS drivers engaged. The TwinTurbo doesn't support VESA 2.0 (or even VESA 1.2) in silicon. To go high res, you must load the provided 1.2 drivers into your config.sys; even then, performance is slow as molasses.

The TwinTurbo supports video scaling and color-space conversion in hardware, but not smoothly because it doesn't do any X- or Y-interpolation. The included Mediamatics MPEG decoder is functional, but not polished.

If you never leave Windows, for even the briefest of deathmatches, the TwinTurbo 128P will satisfy your high-res urges. The straight-up 2D performance is second to none. But the poor video scaling, lack of proper VESA support, and general inflexibility make it hard to recommend this scorcher.



The interface for controlling the TwinTurbo isn't the standard, but it works.

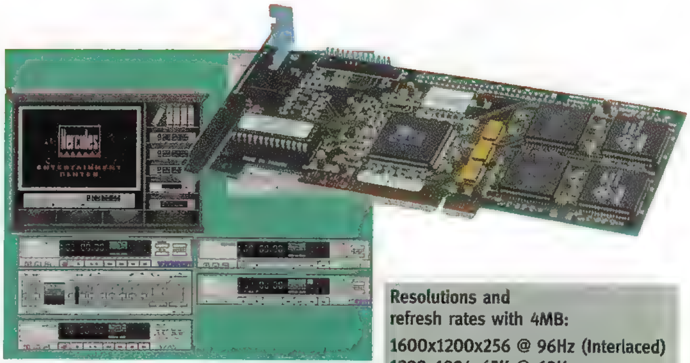
Resolutions and refresh rates with 4MB:

1600x1200x65k @ 75Hz
1280x1024x16.7M @ 90Hz
1024x768x16.7M @ 100Hz

boot verdict

PRODUCT: TwinTurbo 128P
PRICE: $199 (2MB); $299 (4MB); $499 (8MB)
COMPANY: Integrated Micro Solutions
PHONE: 888.467.8282
URL: www.integratedmicro.com

5



The Dynamite 128/Video's lack of polish shows in the cheesy Hercules Entertainment Center.

Resolutions and refresh rates with 4MB:

1600x1200x256 @ 96Hz (Interlaced)
1280x1024x65K @ 60Hz
1024x768x16.7M @ 75Hz

Hercules Dynamite 128/Video

The Tseng-6000 chip that powers the Dynamite 128/Video is one hell of a 2D accelerator, but this implementation from Hercules dampens that thunder. DOS performance is great, and Windows speed is plenty swift, but the package is in need of a spit shine. For example, card controls don't show up in the Display Properties control panel, and must be run separately.

Despite being loaded with 4MB of fast MDRAM memory, the Dynamite 128 couldn't deliver resolutions and color depths equal to the TwinTurbo. And though the hardware does X- and Y-interpolated scaling and color-space conversion for excellent video playback support, the video acceleration is disabled in the higher resolution modes, resulting in ugly and slow MPEG playback. The Xing MPEG playback software is nice, but the Hercules Entertainment Center is cheesy.

Full VESA 2.0 support is built in, so *Quake* runs fine in every resolution, but random white pixels flash about the screen, leaving distracting snow. Other apps tested fine.

Drivers for OS/2, NT, Windows 95, and 3.1 are provided on a disc, and a utility is provided to create floppies for installation.

The Dynamite 128/Video delivers great DOS performance and has full VESA 2.0 built in. It is more than speedy enough for most Windows work, too. But the lack of support for some high-resolution modes, snow in *Quake*, and unpolished drivers mar this card's performance.

Performance Table

	TwinTurbo	Dynamite
Graphics WinMark 96		
1600x1200x8@96(I)	NA	33.4
1600x1200x8@75	36.7	NA
1280x1024x24@75/90	25.4	NA
1280x1024x16@60	34.4	28.9
800x600x24@75	32.4	27.9
Quake		
800x600	NA	9.7fps
320x200	25.3fps	28.9fps
Duke Nukem 3D		
800x600	7fps	27fps
320x200	48fps	85fps
Descent II		
800x600	7fps	NA
640x400	13.8fps	27.2fps
320x200	42fps	NA

All tests were performed on a Pentium 166 with 16MB of RAM. Both graphics cards had 4MB of memory.

boot verdict

PRODUCT: Hercules Dynamite 128/Video
PRICE: $139 (4MB); $119 (2MB)
COMPANY: Hercules
PHONE: 800.532.0600
URL: www.hercules.com

6

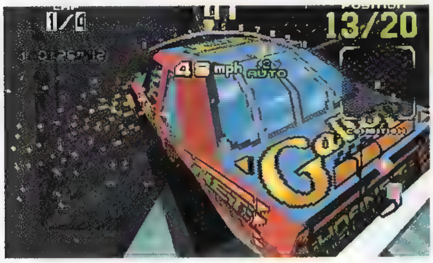
S/W

Daytona USA

Speed doesn't kill

Let's face it, good racing games are all about *feel*. Sure, fully rendered 3D graphics are nifty, but what really matters is how the rubber meets the road. Sega's *Daytona USA* is as close as you're likely to get to the stock-car thrill with a keyboard and mouse; and it's pretty damn close.

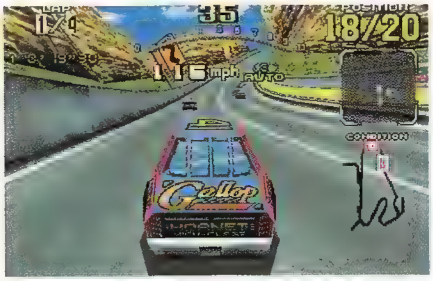
The game is a direct adaptation of the arcade version, complete with impressive stereo sound effects and cheesy singing over the standard TV sports-style theme music. In full-screen mode, the 16-bit 640x480 resolution is smoothly animated and totally engaging, although we expected no less on our P6 200 with a 4MB Millennium. No 3D acceleration is supported, but performance is boosted by a low polygon count: around 50 for your car and a few dozen for the rest of the scene. Believe me, when you're powersliding through turn four at 187mph the blurry graphics will remind you of just how insanely fast you're going, and not that the textures are fairly low res.



The obligatory crash sequence in its early stages. The end-over-end flip follows.

You choose from three tracks, which provide a challenging diversity of setups, including everything from the basic flat loop to a Monaco-style city/highway track that requires serious skill to navigate safely. The intermediate track contains thrilling elevation changes and banked turns that'll keep you on the edge of your seat. A barrage of gauges and timers threatens to distract you from the race, but doesn't really get in the way.

Any of four driving perspectives can be chosen while driving, with the driver's seat being by far the most exciting. The mysteriously named Time Attack mode is a great way to check out each track and find the best lines without the traffic of a full-on race.



***Daytona USA* puts more information in your face than you can possibly enjoy at these speeds!**

I have just two complaints: the music can't be muted and becomes annoying after extended play; and the crash sequence and appearance of your car after a crash is always the same (not to mention the apparently identical performance of the car). Perhaps this is too much to ask from a game that's already such a blast that you'll want to crank it up every chance you get.

— *Neil Redding*

boot verdict

PRICE: $44.95
DEVELOPER: Sega Entertainment
PUBLISHER: Sega Entertainment
PHONE: 800.872.7342
URL: www.sega.com

8

HOW TO CONTACT US

For questions regarding editorial content, advertising, subscriptions, back issues, or reprints:

415.468.4869 (subscriptions)
415.468.4684 (editorial)

150 North Hill Drive,
Brisbane, CA 94005

415.656.2486 (customer service)
415.468.4686 (editorial)

(subscriptions and customers service)
subscribe@bootnet.com

(editorial)
editor@bootnet.com

Advertising Representatives
415.468.4684

National Advertising Manager
Angela Mueters
ext. 171
territory: West

Regional Advertising Manager
Chris Coelho
ext. 170
territory: Midwest

Regional Advertising Manager
Juanita Nessinger
ext. 152
territory: East

ad index

COMPANY	PAGE NUMBER	PRODUCT INFO NUMBER	URL
3Dfx Interactive	10	372	www.3dfx.com/
3Dfx Interactive	28	371	www.3dfx.com/
American Institute for Computer Sciences	109	83	www.aics.com
boot	22, 80	—	www.bootnet.com
CD-ROM Access	109	119	www.cdaccess.com
CH Products	108	110	www.chproducts.com
CompuTalk	110	—	www.CompuTalk.com
Connectix	4	111	www.connectix.com
EarthLink	19	130	www.earthlink.com
Goosebump Graphics	109	—	www.O-C-S.com
Graphic Simulations	9	154	www.graphicsim.com/
Microforum	C3	231	www.microforum.com
Micron	12	232	www.mel.micron.com
Microsoft	26	—	www.microsoft.com/games
Microsoft	C4	—	www.microsoft.com/hardware
Nimantics	21	252	www.nimantics.com
PC Gamer	52	—	www.pcgamer.com
SAS/Bazooka	30	304	www.sasbazooka.com
Segasoft	68	305	www.segasoft.com
Sony Electronics	C2	—	www.sony.com/technology
Total Entertainment Network	16	320	www.ten.net
Ubi Soft	6	332	www.ubisoft.com
WW Technologies	109	360	800.432.0018

We're committed to serving you...

To provide the best customer service possible, we have listed details of how to reach us below.

SUBSCRIPTION INQUIRIES

If you have a change of address, invoice or renewal questions, or haven't received *boot* by the first day of the issue month, please contact us:

Write: boot
Customer Service
150 North Hill Drive
Brisbane, CA 94005

Call: (415) 468-4869
E-mail: subscribe@imagine-inc.com
(type "*boot*" in the subject line)
Fax: (415) 656-2486

When writing us, please include your mailing label showing your address. Please allow at least six weeks notice for any change in subscription record.

BACK ISSUES AND CDs

The price per copy for back issues within the U.S. is $8.99 including postage. For foreign orders, send $12.00 in U.S. funds, which includes airmail delivery. To order just the *bootDisc* within the U.S., send us $6.95 which includes postage. For foreign orders, send $10.00 which includes airmail delivery. All orders must be prepaid and sent to the following address:

boot
Customer Service
150 North Hill Drive
Brisbane, CA 94005

Credit card orders:
Call: (415) 468-4869, M–F, 9 a.m. – 5 p.m. PST
E-mail: subscribe@imagine-inc.com
(type "*boot*" in the subject line)
Fax: (415) 656-2486

RENTING SUBSCRIBER NAMES

boot occasionally rents our subscriber list to other companies that we think offer products of interest to our readers. If you would like your name removed from this list, please let us know.

TECHNICAL SUPPORT FOR THE *bootDISC*

We are committed to bringing you the best possible disc every month. In the disc pages, we provide the phone numbers of the companies whose demos are featured on the *bootDisc*! Please call these companies to assist you with technical support.

TO REPLACE A DAMAGED DISC

Write: boot
Attn: Disc Replacement
150 North Hill Drive
Brisbane, CA 94005
Call: (415) 468-4869, M–F, 9 a.m. – 5 p.m. PST
E-mail: subscribe@imagine-inc.com
(type "*boot*" in the subject line)
Fax: (415) 656-2486

GIFT SUBSCRIPTIONS

To order a gift subscription of *boot* for a fellow PC lover, call 1-888-4IMAGINE.

boot

A-10 Cuba!

Sure, the plane is ugly—but does the game have to be ugly as well?

A-10 Cuba! has two strikes against it right out of the box. Strike one: the documentation (or rather, the lack of it). More than any other kind of PC game, a flight sim *needs* a detailed, well-illustrated hard-copy manual you can refer to while you learn how to fly. Instead, you get an insufferably chatty online manual (complete with patronizing asides telling you what fun you should be having) that must be printed before it's any good.

Strike two: the graphics. Even though only 15,000 square miles of terrain (mostly in and around Guantanamo Bay) are modeled, they are rendered in a flat, drab, polygonal format, with only a passing nod at texturing and 3D effects. Even worse are the explosion and crash graphics, which are rendered in that antique "spewing triangle" style of yore. In fact, except for the fairly crisp rendering of planes and cockpits, there's little on display here that you could not have seen 10 years ago.

And then there's the interface... Instead of the conventional keyboard commands, *A-10 Cuba!* opts for a "virtual cockpit"—i.e., a hand icon appears over the instruments and you mouse-click on them to activate them and cycle through their options. While this is certainly a creative approach, it takes a lot of getting used to and steepens the learning curve to a frustrating degree.

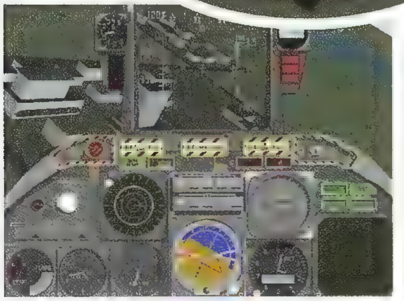
What redeems this sim is the A-10 "Warthog" itself. It's one helluva fun aircraft, if you're in the mood to blow up ground and sea targets instead of dogfighting enemy aircraft. The flight model is convincing, in that it conveys a sense of the heaviness and inertia of the plane, and the missions offer a good variety of targets and challenges.

Also on the plus side: The game supports head-to-head LAN play (up to eight players at one time) as well as modem combat, and the low-res graphics make for smoother, faster, action in these modes. For solo play against the computer, the AI is good and throws enough mission variants your way to make for considerable replay value.

If you can get past the lousy documentation and the stick-in-the-mud graphics, and if you really like to pound ground and sea targets, you'll probably have a good time tooling around Cuban airspace and stirring up trouble. But you'll have to forget the higher quality of many other contemporary sims and engage your "willing suspension of belief" in order to get the most out of the program, and that may be hard for a lot of sim fans to do.

— *William Trotter*

The Warthog may be the ugliest warplane in existence, but it packs a huge wallop.

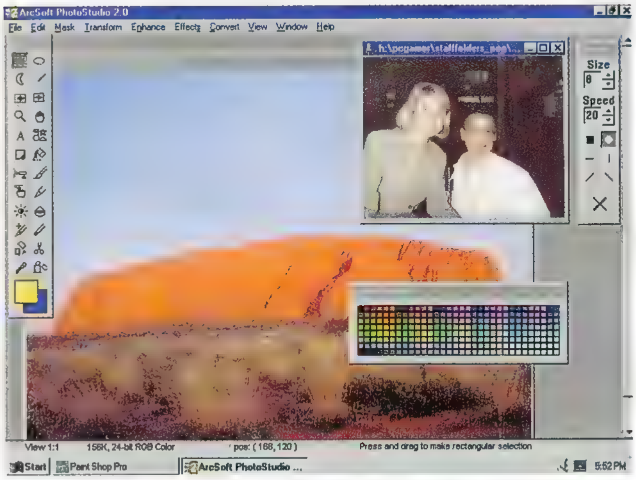


The "virtual cockpit," with hand icon is an interesting concept, but one that takes getting used to.

boot verdict

5

PRICE: $49.95
DEVELOPER: Par Soft Interactive
PUBLISHER: Activision
PHONE: 310.473.9200
URL: www.activision.com



ArcSoft PhotoStudio 2.0
File Edit Mask Transform Enhance Effects Convert View Window Help
h:\pcgamer\staff\folders_pac\...
Size
8
Speed
20
Start
Paint Shop Pro
ArcSoft PhotoStudio ...
5:52 PM

View 1:1 156K, 24-bit RGB Color pos: (168,120) Press and drag to make rectangular selection

The overall look and feel of Arcsoft's *PhotoStudio* is reminiscent of its Adobe *Photoshop* counterpart.

PhotoStudio

For the rest of us

Most professional-caliber software packages tout premium price tags that reflect their purpose. But if you're not separating four-color scans for *National Geographic*, why bother with a $500-plus image-editing program when Arcsoft's *PhotoStudio* delivers most of the whistles and bells for less than $100?

The basic tool palette in *PhotoStudio* should be familiar to Adobe *Photoshop* users. Among the essentials included are freehand and rectangle/elliptical selection, magic wand selection, cloning, cropping, text input, and bucket fill. *Illustrator* users will be familiar with the Transform tool, which resizes a selection. Double clicking on the tool, however, changes the settings and performs rotations, skewed angles, and perspective changes.

In addition to all the usual suspects (sharpen, blur, etc.), *PhotoStudio* supports the vast array of *Photoshop* plug-ins for image enhancement and manipulation, from diverse libraries such as *Kai's Power Tools* and *Gallery Effects*. And all filters are real-time previewed in thumbnail form before you commit to applying them.

And when it comes time to get images into the application, *PhotoStudio* is completely TWAIN-compliant for use with most scanners and digital cameras.

Pre-press and photo illustration professionals will find *PhotoStudio* coming up short with its lack of support for composite CMYK editing; and the tonal correction tools are dodgy at best. There is no support for layering, so composition and collaging are unduly difficult.

Still, ArcSoft has produced a very useable and flexible product for casual dabblers, and World Wide Web weavers will especially enjoy its myriad filters and its ability to import/export a broad assortment of file formats (BMP, EPS, GIF/GIF89A, JPEG, PCD, PCX, TIFF, TGA). *PhotoStudio* also includes a slide show screensaver with more than 100 transition effects and descriptions. With access to the plethora of plug-ins and powerful tools built in, *PhotoStudio* will give anyone access to the tools needed to work like a pro.

— *Quintin Doroquez*

boot verdict

8

PRICE: $99
DEVELOPER: ArcSoft
PUBLISHER: ArcSoft
PHONE: 510.440.9901
URL: www.arcsoft.com

H/W

Comstar 33.6Kbps V/F/D/SVD Modem

Breaker, breaker good buddy

Zoom's latest modem, the Comstar 33.6 SVD, makes a worthy contender in the fledgling class of simultaneous voice/data modems.

Getting this champion ready is as easy as plugging the 16-bit board into a free ISA slot, connecting the included speaker and microphone, booting up, and loading the driver when prompted; two minutes later you're ready to rumble. SVD modems are the rage in online gaming because they allow you to trade taunts while trading blows, and the Comstar comes through loud and clear on both counts.

Transfer rates define a good modem, and the Comstar SVD doesn't disappoint. Using a Win95 FTP client, a 1096K text file took a brief 10,210cps to send to our server's incoming 28.8Kbps PPP line. Sending a 1007K WAV file returned a more believable 2,680cps. The same files sent on a 33.6Kbps Supramodem took 3,852cps for the text file and a tired 1,676cps for the WAV file.

The Comstar uses the same Rockwell AudioSpan technology as other ASVD modems. All the normal MNP error correction, fax groups, and V.34 standards are included as well. *BitWare*, the bundled multiple mailbox voicemail/fax center software, is quite robust and integrates nicely with the Caller ID and Distinctive Ring features.

The single (inferior) speaker provided to monitor connection status is not worth the difference in price compared to, say, the $129 Supramodem 33.6I SP with ASVD. Especially compounded with the sad WAV file transfer rate. On the plus side, voice quality was very good and, overall, the Comstar is very easy to use.

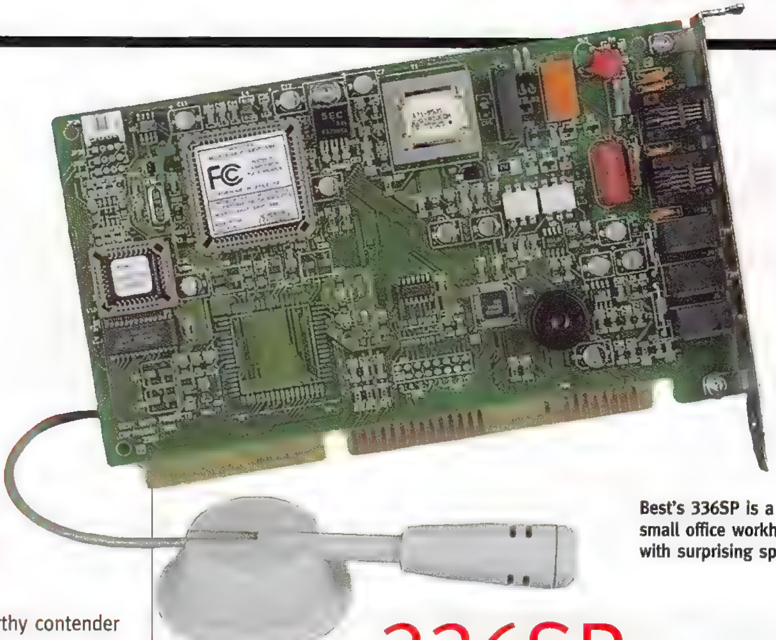
— Daevid Vincent

Zoom's Comstar 33.6 SVD modem provides a hearty feature set and software package, and a not-so-hearty spare speaker.

boot verdict

PRICE: $199
COMPANY: Zoom Telephonics
PHONE: 800.631.3116
URL: www.zoomtel.com

7



Best's 336SP is a small office workhorse with surprising speed.

336SP 33.6Kbps V/F/D Modem

Lives up to the "Best" name for small businesses

The Best Data 336SP internal voice/fax/data modem is an affordable and capable solution for small offices, and edges out other modems at transferring hard-to-compress data.

The modem has everything you'd expect, including V.34 and V.FC, MNP10 for cellular users, Caller ID, as well as Distinctive Ring detection. Sending a 1096K text file to at 33.6Kbps achieved transfer rates of 3,855cps. That's pretty good for most modems, but only average for modems of this caliber. While sending a 1007K WAV file (notorious for resisting compression) transfer held at an impressive 2,075cps (compared to the Zoom Comstar SVD modem, which struggled along at 1,676cps). These results were achieved by simply installing the PnP ISA card, loading up *HyperTerminal*, and sending. Speeds could be improved even more by tweaking the AT command set.

Another snazzy feature is the Music On Hold plug, which entertains the person on hold with audio from any source connected via the included *QuickLink* software.

Minor annoyance: You'll have to track your 336SP's connect status via the onboard piezo speaker, instead of your PC's external speakers.

The 336SP is a good buy if you don't care about SVD. With multiple mailboxes (complete with pager notification and remote message retrieval), fax broadcasting, and that spiffy Music On Hold feature, it's especially good for a business with several employees, and can really add a professional touch to any enterprising company.

— Daevid Vincent

boot verdict

PRICE: $179
COMPANY: Best Data
PHONE: 818.773.9600
URL: www.bestdata.com

8

S/W

Star Trek: Borg

Resistance is not futile

For the record, I'm a huge Borg fan, but this fiasco was just flat-out disappointing. Unfortunately, there isn't much about this three CD-ROM set that can justify how lame it is.

As Cadet Furlong (and later, Lt. Sprint) aboard the USS Righteous, you travel back 10 years—thanks to that omnipotent Q—and find yourself on a mission to save your father and defeat the Borg. (Which curiously contradicts the recent movie—diehards ponder things like this all day.)

When you *actually* get to make a decision, it's very much like the old *Dragon's Lair* game. A simple click results in a whole video segment playing.

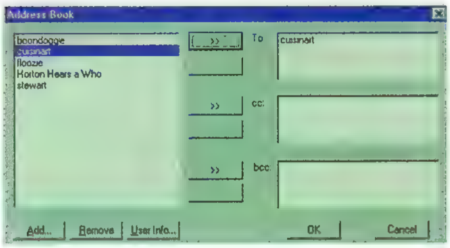
Not that the actual gameplay is any good. Most everything requires tedious trial and error. Since you're not given any clues to help you operate even basic things such as the turbo lift or control panels, you must scan everything with the special tricorder that Q gives you. All this makes you feel like the most retarded lieutenant in Star Fleet.

This program's only saving grace is the 120 minutes of never-before-seen video. Of course, the only people you'll recognize are the Borg and John De Lancie. And STTNG enthusiasts will also appreciate the wealth of information loaded into the tricorder. — *DV*

boot verdict

PRICE: $49.95
DEVELOPER: Touchscreen Media Group
PUBLISHER: Simon & Schuster Interactive
PHONE: 212.698.7000
URL: www.mcp.com/musoft/ssint

3



Internet VoiceMail

Hear you, hear me

For the price of an executive lunch, *Internet VoiceMail* makes attaching audio recordings to your e-mail a piece of cake.

But since Win95 already makes it simple to stuff your voice into a WAV, and every e-mail program on the planet can attach that file to a message and speed it to its destination, who cares? Well, turns out there *are* a couple of advantages to using *Internet VoiceMail.*

First, its compression scheme is slightly better at minimizing file size than any option included with the Win95 Sound Recorder. You can fit a clear-sounding two minute monologue into 200K. Second, the receiver doesn't need any special player programs—you can include the 169K *VoiceMail* player with your message.

The program works as a basic e-mail program as well, including an address book (but you won't want to switch from your regular program). In fact, *Internet VoiceMail* would be a more elegant product if it worked as a plug-in to your existing e-mailer (but it doesn't).

The included microphone is worth the price of this package if you expect to send voice recordings regularly; otherwise save your change. It's an unnecessary gimmick. — *NR*

boot verdict

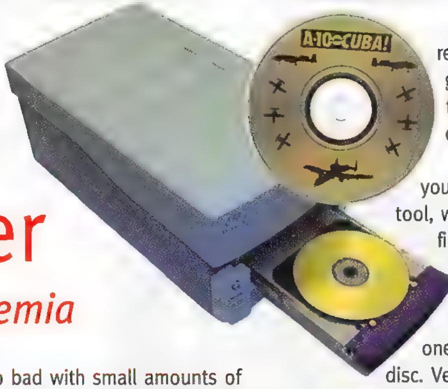
PRICE: $29.95
DEVELOPER: VocalTec
PUBLISHER: VocalTec
PHONE: 201.768.9400
URL: www.vocaltec.com

5

H/W

Rimage Perfect Image CD Printer

Headaches, hypertension, and anemia



Do your friends laugh at the illegible scrawl written on your home-brewed CDs? Do they snub your Magic Marker homage to the original label? Rimage's Prefect Image uses a patented thermal transfer printing technology to print straight to your CD-R discs.

But this monochrome or monogold (depending on the disc media used) printer won't fool anyone into thinking you actually *paid* for *Photoshop.*

Basically, the printer head moves back and forth across an ink ribbon as the disc drawer opens, moving the disc much like a noisy dot-matrix printer.

While not so bad with small amounts of black text, this method is all-bad with anything more. Letters are defined with mottled edges and larger areas show inconsistent coverage.

The *Label Editor* software's monochrome interface hides a crippled underbelly that's prone to cause headaches and hypertension. While allowing you to place text in a semi or complete circle, upside down, or straight across in any size available for any installed font, there are no tools to center, align, or condense text. Special characters, such as the copyright symbol, require typing: alt+0169. And forget copying from other applications. *Label Editor*'s clipboard only works within the application.

To get graphics on your disc, you'll have to use the anemic import tool, which only works with bitmap files. Create a 5x8-inch bitmap file (the only format supported) in *Photoshop* and prepare to be surprised when it lands in a one-inch square when placed on the disc. Very confusing. There are no tools to resize the image, forcing you to go back to the source application to resize and import it again. This hassle will make you long for the simple joys of plain ol' copy and paste.

The Perfect Image printer is passable for quick labeling, but is certainly nowhere near worth the $4,000 price tag. — *SC*

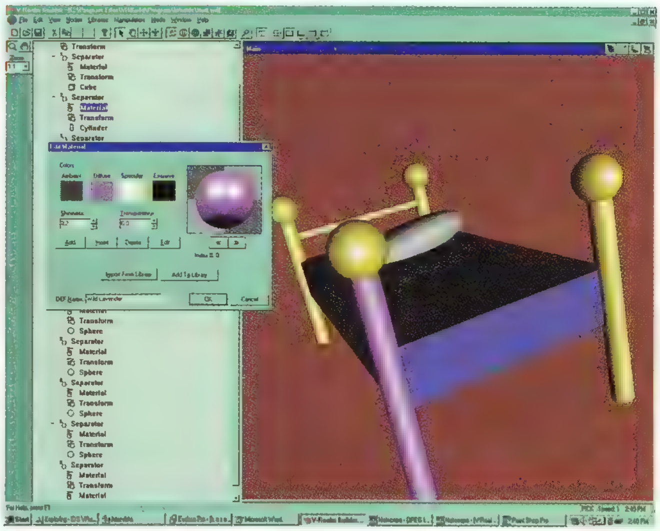
boot verdict

PRICE: $3,995
COMPANY: Rimage Corp.
PHONE: 800.445.8288
URL: www.rimage.com

4

V-Realm **Builder**

Weaving the virtual world

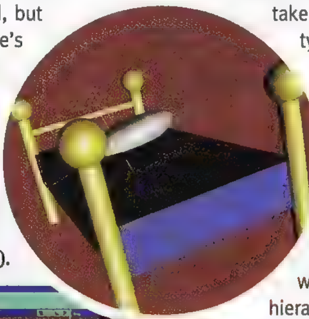


Using the Material editor to change the color of a bedpost. Note that the change is already visible in the Rendered Scene window.

By now you're aware of VRML, the whiz-bang technology that's bringing 3D to your web browser. It's exciting, it's hip, it's the Next Big Thing. However, creating VRML is still a world apart from hacking HTML; you really must comprehend the big picture before you can get predictable results.

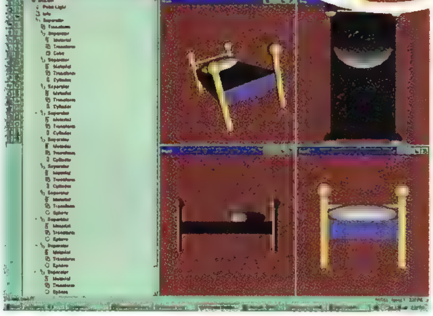
If you're willing to put in the time to understand VRML, *V-Realm Builder* will reward you with the ability to author *anything* the VRML 1.0 standard supports in a full-featured, interactively rendered environment. Note that familiarity with the structure of VRML is not merely recommended, it is *required* for any serious scene editing with *Builder.*

Builder initially presents you with an empty world without form. Rather than first creating light (you can do that later), you'll want to zap in some 3D objects and arrange them. *Builder* comes with a good-sized library of models to get you started, but for distinctive spaces there's no substitute for creating the objects yourself. *Builder* doesn't provide modeling capabilities, but any popular modeling program will do, since *Builder* imports all the standard formats (*3D Studio, AutoCAD, Open Inventor,* and VRML 1.0). Keep in mind that the more polygons an object contains, the longer it will take to download and render when browsing, so using VRML's built-in geometric primitives (cube, cone, and cylinder) whenever possible is a good idea.



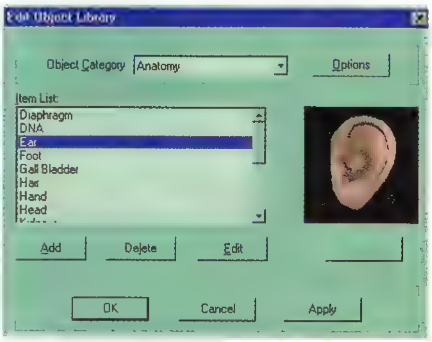
Using the Center Ball Manipulator to reorient the pillow (for greater comfort, of course!).

Now that your world is starting to take shape, you'll appreciate the high-quality rendering *Builder* performs via OpenGL. Every change is instantly visible and can be viewed from any angle. Your favorite perspectives are easily saved as viewpoints, which most VRML browsers make available for quick navigation of a scene. Most manipulation of scene elements happens in the Scene Graph window, which presents a set of VRML nodes in a hierarchical relationship, as dictated by the VRML 1.0 specification. Arrangement of objects can be tricky; the manipulators *Builder* provides are fairly intuitive but difficult to control precisely, and numeric editing of object parameters (size, location, etc.) often becomes tedious. On the upside, any Transform (the VRML construct for hierarchical object placement and sizing) you create can be saved in the Transform library for reuse, easing the process of creating complex scenes with repeated elements.



While viewing the VRML scene graph for your world (on the left), you can check out your scene from multiple angles at once.

Adding materials and texture maps to your objects is a good way to increase their interest, and *Builder* makes this simple as well. The Material library contains lots of interesting starting points, and the Material editor makes for precise control over every aspect of a surface, including shininess, transparency, and color. In addition to those in the Texture library, your favorite GIF, JPEG, or RGB image can be mapped onto any object's surface.



You can save your own objects in the Object library, as well as browse the numerous included objects.

Documentation and online help could be improved, and the included tutorials barely scratch the surface of the program's functionality. Once you're comfortable with VRML, though, you will find *V-Realm Builder* a pleasure to work with, and a welcome timesaver for VRML world building.

— *Neil Redding*

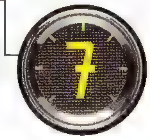
The V-Realm Browser and VRML 2.0

Integrated Data Systems includes its own VRML 1.0 browser with *V-Realm Builder,* in both standalone and *Netscape* plug-in form. Despite several unique features, such as a heads-up display-style navigation interface and user-definable viewpoints, the *V-Realm Browser* is not in wide use; far more people use SGI's *CosmoPlayer* or Intervista's *WorldView.* The primary reason is VRML 2.0: *V-Realm*'s browser doesn't support this latest revision of the VRML specification, and much of the compelling content currently available is written in VRML 2.0.

Since *Builder 1.1* can export to VRML 2.0 and IDS promises full VRML 2.0 support in an upcoming release, perhaps an update for this browser is also in the works.

boot verdict

PRICE: $249
DEVELOPER: Integrated Data Systems
PUBLISHER: Integrated Data Systems
PHONE: 912.236.4374
URL: www.ids-net.com



S/W

Who's Fat Lou?

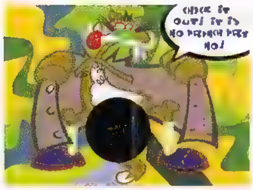
I've got your french fry... right here!

Who's Fat Lou? is a twisted graphic adventure filled with grotesque visions of death, vomit, and life on the street. If that piques your interest, you *deserve* this game.

Stuffed with scatological humor presented in the most immature manner imaginable, we found ourselves doubled over with laughter watching this disc. Problem is, we were laughing at the game's poor execution, not its jokes.

The polished art is inspired by street graffiti and the lingo is straight up hip hop. Unfortunately, gameplay is horrid: Guess the answers to stupid questions, solve badly designed puzzles (all 10 of them), gather an inventory and try to figure out how to use the stuff, and so on. The best part of this mess is the finale, where you build a rap by dragging icons representing samples and scratches onto a three-track studio. Just to keep things interesting, a steady stream of foul language and sexual innuendo flows.

Frankly, I'd rather stub my toe. — *AS*



boot verdict

PRICE: $24.99
DEVELOPER: Mediola
PUBLISHER: Mediola
PHONE: 212.647.0850

3

Diva-X: Rebecca

Getting all touchy feely

boot KICK ASS! PRODUCT

Make no mistake: *Diva-X: Rebecca* is a hardcore disc for mature adults who like their interactivity racy. But before you discount this disc as yet another sleazy knockoff, take a peep. *Diva-X: Rebecca* is the best adult disc ever produced.

Along with a 24-minute long 272x204 24-bit video (which can be zoomed to double that size) detailing your introduction to the beautiful French model Rebecca; and your subsequent intimate encounter (portrayed in a manner that leaves *nothing* to the imagination), this disc also includes a couple of noteworthy technologies that go beyond its steamy nature.

The first is the vastly-improved version 2.0 of TFUI (Touch Feel User Interface). While this feature produced more frustration than satisfaction in the first *Diva-X* disc (*Ariana*); the wrinkles have now been smoothed out, allowing you to interact with your on-screen video consort in real time with astonishing precision. And your best performances can be captured with the disc's other outstanding feature, X-Director, which allows you to record, edit, and play back the action, just the way you like. The variations are endless, and the underlying technologies are powerful enough that they would work in most any context. Dance choreography comes to mind.

All that's missing now is a multiplayer version of *Diva-X*. — *BD*

boot verdict

PRICE: $59.95
DEVELOPER: Pixis
PUBLISHER: Pixis
PHONE: 714.252.1010
URL: www.planetpixis.com

9

Leisure Suit Larry 7: Love for Sail!

Early to bed, early to rise

Leisure Suit Larry 7: Love for Sail! gushes with sexual innuendo, risqué humor, and beautiful cartoon women, but this polyester sequel is all foreplay, no action.

In this latest episode, our hero finds himself on an ocean liner, competing in the Thygh's Man Trophy contest, named appropriately after the ship's shapely captain. Throughout the game, you'll find yourself bumping and grinding into well-endowed celebrities including Dewmi Moore, and Wydoncha and Nailmi Jugg.

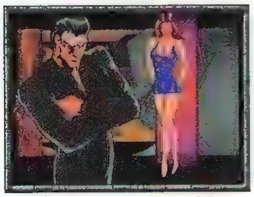
More than 30 game locations contain more than 200 scenes, all hand-drawn, scanned, and digitally enhanced (without the use of silicon). Overall, the graphics, animation, and voice-acting are terrific.

The adventure portion consists of numerous puzzles, all with lewd payoffs. If you enjoy juvenile humor (including the Where's Dildo? and Naked Liar's Dice game segments), you'll like *LSL7*. If not, you'll probably find it rather limp. Sierra would've been smart to pack a bottle of amyl nitrate in the box, instead of a lame scratch-and-sniff card. — *BDR*

boot verdict

PRICE: $49.95
DEVELOPER: Sierra On-Line
PUBLISHER: Sierra On-Line
PHONE: 800.757.7707
URL: www.sierra.com

6



The Lords of Tantrazz

Plan 9 failed

There's nothing that says a B-movie can't be entertaining; and there's no reason the same caliber of computer game can't also have redeeming qualities.

The premise behind the latest title from Atlantean (the Ed Wood of CD-ROMs) is sound: busty babes battling bone faced bad guy in balls-out violencefest. Unfortunately, the actual gameplay centers around inane puzzles, instead of the promised violence or teased sex. For example, early in the game you are "tested" with a grid of flashing lights. No explanation. If you fail to guess the point of this abstract screen, it's Game Over.

The Jim Lee-inspired art and layout of the game (interspersed with the occasional weak video clip) is sound, and Alice Cooper's raspy vocal talents work as the villainous "Hunger," but overall, the game would have been more satisfying if it had just stuck with being a click-through comic book. — *BD*

boot verdict

PRICE: $39.95
DEVELOPER: Atlantean Interactive
PUBLISHER: Atlantean Interactive
PHONE: 818.908.9663
URL: www.atlantean.com

5

Phantasmagoria 2: A Puzzle of Flesh

A rotting corpse

No well-known actors were harmed in the making of *A Puzzle of Flesh.*

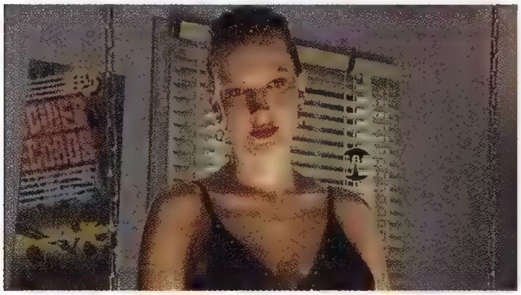
Aside from its name, *A Puzzle of Flesh* doesn't bear any resemblance to the original *Phantasmagoria.* First off, the story was written by Lorelei Shannon, and *not* Roberta Williams. Secondly, the game doesn't take place in a creepy, haunted house. And while the original *Phantasmagoria* was entrenched in horror, *A Puzzle of Flesh* is just horrifically boring.

Unlike its predecessor, *A Puzzle of Flesh* doesn't weave in digitized footage of actors with traditional animated scenes. Instead, the entire game is comprised of FMV segments and still images (movies are triggered by hot spots integrated into the still clips). The nearly four hours of video in the game were edited down from more than 55 hours of tape shot during a 10 month period.

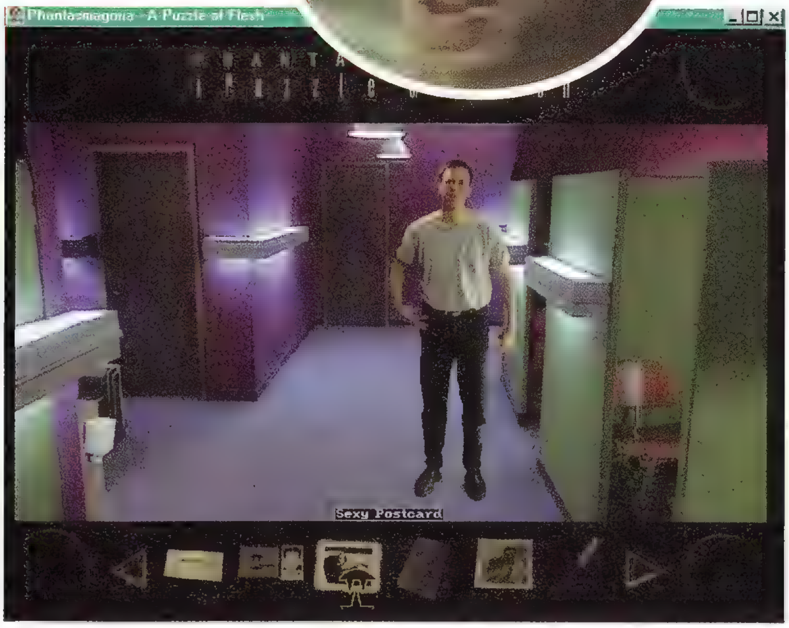
***Phantasmagoria 2* is peppered with racy dialogue and sexual innuendo.**

Physical special effects were created using a combination of prostheses, rubber, latex, and buckets of fake blood; post-edit effects were created using Adobe *After Effects.* The video data was then compressed using Duck's TrueMotion technology (each of the five game chapters are contained on individual discs, eliminating the need to swap discs between chapters).

Sierra spent almost 3 million dollars on *A Puzzle of Flesh*, and although the game looks and sounds terrific (all music and effects were recorded at 44.1kHz), the story falls flat, and is uninspired. Whereas *Phantasmagoria* had a compelling, intricate setting (a haunted mansion, replete with evil magicians, demons, and spirits), *A Puzzle of Flesh* is bogged down trying to tell a story that wouldn't even pass as a cheesy TV movie of the week. (The biggest problem is the game's primary setting: the third floor office of a pharmaceutical company.)



In a disturbing S&M scene, you'll be drugged, pierced, and left hanging in chains.



Fidgeters (filmed actors standing by, waiting to move), were filmed on set or against a blue screen and then palletized with Adobe *After Effects.*

The goon squad, or friendly neighborhood welcome wagon? You decide.

The story isn't engrossing enough to make you care about the characters (even with the unexpected *X-Files*-esque twist), and its slow pace may cause you to turn the game off, *before* even the first murder has occurred. Considering the final 140-page script was whittled down from more than 500 pages, you have to wonder what plot elements were cut out.

A Puzzle of Flesh is adorned with an intuitive interface, which includes a game map, inventory control, and a video playback feature that allows you to view any movie segments already triggered in the game (it's fun to go back and watch the grisly scenes again and again). But that aside, the game is really just an exercise in mouse clicking that triggers well-acted movie clips. The game is extremely linear, and doesn't allow independent exploration and interaction.

If you enjoyed the original *Phantasmagoria*, you'll be disappointed by the lack of vision, dull storyline, and boring cast of characters in *A Puzzle of Flesh.*

— Bryan Del Rizzo

boot verdict

PRICE: $59.95
DEVELOPER: Sierra On-Line
PUBLISHER: Sierra On-Line
PHONE: 800.757.7707
URL: www.sierra.com

3

The **Art** of **War** Gaming

Spells and gristle with all the bells and whistles

If imitation is the highest form of flattery, you'd figure the geniuses at Westwood Studios and Blizzard Entertainment would be ecstatic to witness their games give birth to so many obvious clones. But while a few progeny will be rightfully recognized as prodigal sons, most are destined to become black sheep. Check out the latest batch of candidates to see which will be invited to future family gatherings and which will be forgotten. — Brad Craig

War Wind

Food for the gods

SSI, veteran of many an on-screen skirmish, knows a thing or two about war games. So it should come as no surprise that their latest offering, *War Wind,* delivers challenging and satisfying real-time battles that challenge the wits, as well as the reflexes.

Despite its obvious resemblance to *WarCraft II*, this strategy game's complex plots and engaging characters distinguish it from the pack of clones. There's much more to *War Wind* than just build and kill; toss in the included scenario editor and your potential conquests are limitless.

Choose a campaign mode, which has seven missions, or select an existing scenario. Then find resources, build workers, and improve your units—all while staying alive to complete your mission goals. Construct new buildings to study different technology classes in order to upgrade your units and generate new ones.

The intuitive AI in *War Wind* learns from the player. For example, if you discover that building a wall helps your troops, the AI will learn from that and build its own wall. Overall, the AI is ruthless and adheres to the belief that the best defense is a good offense.

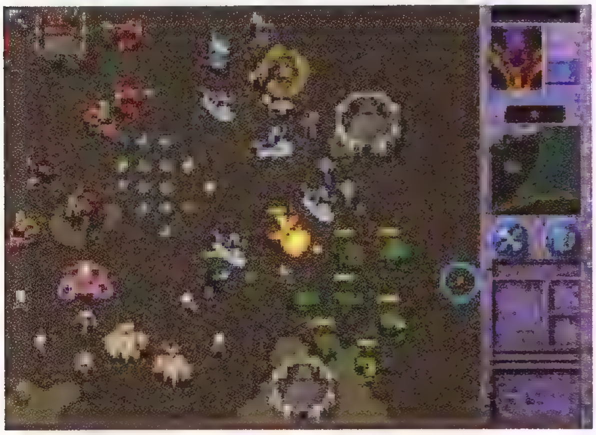
War Wind is Win95 native and utilizes DirectX to deliver smooth cinematics and responsive game performance. Game resolution is 640x480 at 256 colors. Gameplay is enhanced by digital audio effects and music with 16-bit resolution—network players will experience MIDI music only.

War Wind is a challenging, real-time war game. If you've already mastered *WarCraft II*, and are looking for a game with a fresh new twist, *War Wind* is a worthy candidate.

boot verdict

PRICE: $49.95
DEVELOPER: DreamForge
PUBLISHER: SSI
PHONE: 408.737.6800
URL: www.ssionline.com

8


In ***War Wind***'s battle for supremacy, magic plays an important role.

Blood & Magic

A bloodless bore

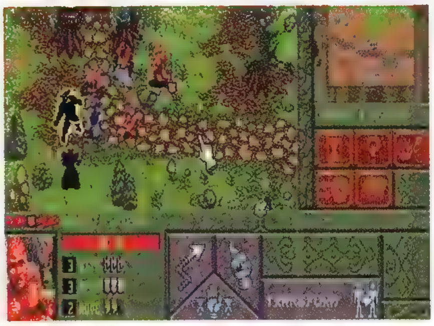
Blood & Magic is a rambling tale of romance, revenge, valor, and fame, with a dose of good versus evil tossed in. There's also a mystery to be pondered: How could a game that sounds as exciting as this wind up being so dull?

The story unfolds in a dark corner of the Forgotten Realms universe. As a powerful wizard, you command (and battle) 28 monsters (including Goblin hordes and Lords of Chaos), travel through exotic landscapes, and employ strange and exotic magic to defeat your enemies in your bid to become master of the Realm.

Unfortunately, the 2D graphics in *Blood & Magic* are surprisingly dull, and this visual malaise is not helped at all by the disappointing maximum screen resolution of 320x400 at 256 colors.

The AI is another sore spot. This game really wears on your patience. For example, waiting for your Golems to gather mana is time consuming and distracting. This sort of mundane management is perhaps the game's single biggest disappointment.

Blood & Magic's combat engine, on the other hand, offers a hearty challenge. The capable engine identifies the highest threat and plots a course of action.


Mundane details such as Golem management make *Blood & Magic* feel like a day at the office.

When playing against the computer grows wearisome, you can challenge other wizards via the network, direct connection, or by modem.

The overall mediocre graphic detail and dull gameplay make this a B-title in any realm.

boot verdict

PRICE: $49.95
DEVELOPER: Tachyon Studios
PUBLISHER: Interplay Productions
PHONE: 800.969.4263
URL: www.interplay.com

4

7th Legion

MechWarrior joins the foreign legion

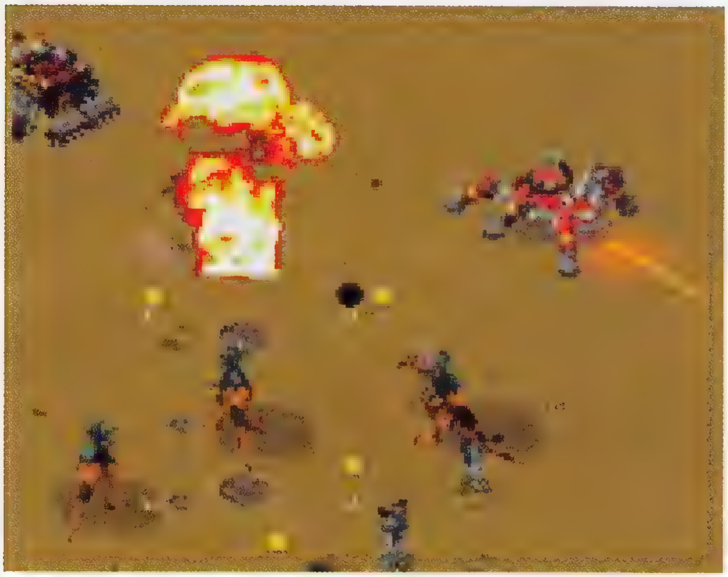
boot KICK ASS! PRODUCT

7th Legion is a unique combination of strategy and action elements with real-time gameplay. Unlike most war/strategy games, where you spend half your time managing resources (mining or cutting down trees, for example), *7th Legion* actually rewards you for killing off your opponent. The more you kill, the richer you become. The emphasis here is on the battle itself.

A native Win95 game, *7th Legion* uses thousands of pre-rendered sprites and animation, offering fast and smooth action on low-end Pentiums and more detailed enhancements on high-end Pentium Pro and MMX machines. *7th Legion* also offers multiple screen resolutions and color depths, but at 640x480 with 16-bit color, the game's lighting effects and graphic detail are nothing short of dazzling.

7th Legion combines the best elements of *Red Alert* and *MechWarrior 2.*

There's a bevy of cool buildings to erect and war units to deploy. The game features a unique ranking system, power-ups, and a card system,



With clever AI and an innovative system of rankings and power-ups, *7th Legion* rocks.

all tied to the thrilling gameplay. The ranking system allows your units to advance and improve their skills of combat. The higher the rank, the more accurate your unit becomes and the more damage you can inflict on lower-ranked units (sort of like those Citadel cadets). Strategy is an important factor in the game, but special action cards for mega-health, rapid-fire, rapid unit, and stealth unit are thrown into the mix to spice up your conquests.

The AI and subsystems are based on a neural network: The computer opponents and environmental factors adjust to your style of play. If you develop a technique that proves particularly successful, the AI will develop a strong counter-attack/defense to head off your efforts, effectively forcing you to rethink your strategy.

Ideal for beginners as well as advanced gamers, *7th Legion* is a war/strategy game that's fast, furious, and most of all, fun.

boot verdict

PRICE: $49.95
DEVELOPER: Vision Software
PUBLISHER: Epic MegaGames
PHONE: 800.972.7434
URL: www.epicgames.com

9

M.A.X.

Do you feel lucky, punk?

In *M.A.X.*, the world order has fragmented into eight clans, all competing to find and protect new worlds for their people. This derivative game's lackluster missions include: building mines, building structures to manufacture tanks and other weapons, defending your buildings from the enemy, and conquering new territories.

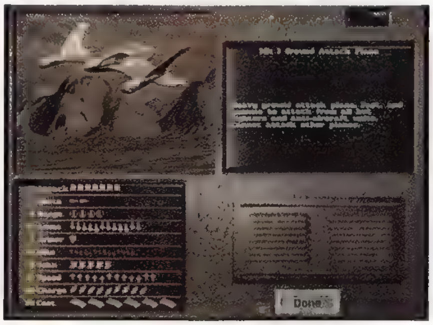
Sound familiar? It should.

M.A.X. is yet another *Command & Conquer* clone, but despite this fine role model, *M.A.X.* isn't nearly as much fun.

Traditional turn-based gameplay and simultaneous mode—where both players make movements and fight battles at the same time—alternate in the game, but neither go far toward engaging the player.

The sprite-based graphics look good at 640x480, but they aren't groundbreaking.

The AI is algorithmic, not scripted, so decisions such as retreats, coordinated assaults, and suicide attacks are made only when the objectives can be justified. The AI plays differently even in pre-made scenarios, so if you've been attacked from the flank in a previous battle, don't assume it'll play out the same way again. This unpredictability adds to the game's considerable replay value.



***M.A.X.* has an assortment of cool looking craft.**

With solid graphics and uninspired missions, lukewarm gameplay and dynamic AI, *M.A.X.* isn't really that bad of a game, it's just not a huge leap forward.

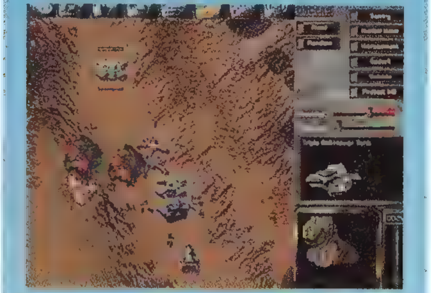
boot verdict

PRICE: $49.95
DEVELOPER: Interplay Productions
PUBLISHER: Interplay Productions
PHONE: 800.969.4263
URL: www.interplay.com

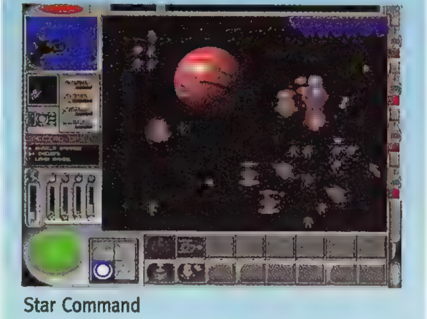
7

Within Striking Distance

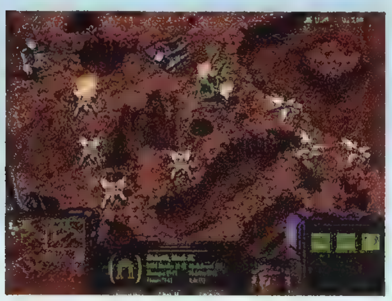
Where in the universe will the next real-time strategy game attack? Here are some titles that are almost ready to rumble.



Dark Reign
Activision's *Dark Reign* will even take the terrain into consideration, and with more than 35 units divided among the Imperium and the Freedom Guards, *Dark Reign* could be a contender for war/strategy game of the year.



Star Command
GT Interactive's epic tale of interstellar combat and resource management will battle with Blizzard's *StarCraft* for your attention, but you can bet there's gonna be a lot of charred space cruisers before your conquest of the galaxy is over.



StarCraft
Blizzard's ode to the darker side of human nature has taken to the stars in *StarCraft*, with two other equally violent races to choose from in their quest to see who is the master of the known universe.

Activision: www.activision.com
GT Interactive: www.gtinteractive.com
Blizzard: www.blizzard.com

boot labs Review Policies

1 2 3 4 5 6 7 8 9
BOOT RATING
boot-o-meter
5
WINDOWS GRAPHICS
5
DESCENT II
5
QUAKE
5
PREMIERE TRANSITION
5
PHOTOSHOP FILTER
5
LIGHTWAVE 3D RENDER

__boot__ isn't like any other computer magazine, and neither is our product __evaluation__ process. We don't test equipment in the cold, sterile environment of a warehouse-sized lab, and we don't write our reviews based on the __test scores__ that lab-coat-wearing technicians scribble on clipboards.

Our review __scores__ are based on a combination of objective __benchmark__ testing, real-world performance, and our __subjective__ evaluation of features, performance, and the many less tangible __characteristics__ that go into a product. All of our evaluations are based on __hands-on__ use of the product.

Only the **best** earn enough respect to be worthy of our **editors'** **choice** award.

The boot-o-meter explained

For our tests, we use Ziff-Davis' WinBench 96 suite of benchmarks to measure CD-ROM and hard-disk drive performance (kilobytes per second), as well as graphics speed under Windows (millions of pixels per second).

All systems are tested at 1024x768 resolution with 16-bit color depth. All notebooks are tested at 800x600 resolution with 16-bit color depth (they're also tested at higher resolutions, if higher resolutions are supported).

We judge DOS video performance by measuring the number of frames per second that a system is capable of pumping out while playing games such as *Descent II* (at 640x400 resolution) and *Quake* (at 640x480 resolution on desktop systems; 320x480 res on notebooks).

In our real-world tests, we measure how long it takes a system to perform specific tasks: rendering a video transition in Adobe's *Premiere*, applying a Gaussian-blur in *Photoshop*, and rendering a wireframe scene in NewTek's *LightWave 3D*.

The performance is gauged on a scale of 1 to 9 in each of these areas; we then average the scores, and arrive at an overall performance rating. The details of each test (specific frame counts and such) are always available on the *bootNet* Web site at **www.bootnet.com.**

Our performance scales are based on systems that we consider to be among the best in their class, and we change those reference standards every six months. If the system reviewed equals or exceeds the performance of the reference platform (a score of five or better), the boot-o-meter dial is green; if it scores a four, the dial is yellow; and if it scores a three or less, the dial is red.

Our Reference Desktop PC

***Gateway's P5-166XL** is our reference desktop computer because it's a workhorse, delivering solid benchmark scores all around. Systems shipped since the P5-166XL—especially 200MHz Pentium systems—should at least match its performance.*

Our Reference Notebook PC

*We selected **Fujitsu's Monte Carlo** as our reference notebook because of its excellent benchmark scores. The Monte Carlo's use of more expensive VRAM, instead of the slower DRAM, resulted in exceptional graphics performance.*

The bootVerdict

The fastest computer in the world is useless if it's poorly designed. That's why we evaluate a host of subjective criteria in addition to rigid benchmarks. We look at a machine's overall design, its ergonomics, expandability, ruggedness, and advanced features.

We also carefully consider a manufacturer's component choices, including the quality of the sound card, speakers, modem, keyboard, and mouse. We count expansion slots and drive bays. We take off the case and put it back on. We plug in drives and cards to judge how easy—or difficult—it is to expand the machine. These might seem like minor considerations, but they have an enormous impact on the level of satisfaction a new computer delivers. Our final rating is an amalgamation of the objective benchmark ratings and these subjective judgements.

DOUBLE TAKES
GIVE A SECOND EDITOR'S HANDS-ON OPINION OF THE SYSTEM BEING REVIEWED.

boot radar

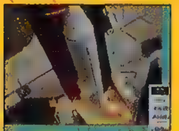
PRODUCT ANNOUNCEMENTS: THEY **TELL** US, WE **PASS** IT ALONG

9.0 on the Richter Scale

Quake fans rejoice! Two new mission packs are coming your way. **Mission Pack #1** will contain 15 levels packed into three explosive episodes: Fortress of the Dead, Dominion of Darkness, and The Rift; and introduce villainous new enemies, including hordes of goblins and huge scorpions adorned with a nasty stinger. **Mission Pack #2** will contain an additional 15 levels, and will feature new weapons including lava nails and plasma guns. Both expansion packs will retail for $39.95 and will be available in early 1997.

Activision: 800.477.3650; www.activision.com

Smile! You're on Video e-mail!



Tired of reading e-mail? Why not listen to your mail messages or watch them instead? With **Video Express Mail**, you'll be able to integrate video and audio messages directly into the e-mail you send around the world. Using a microphone and video capture system, you'll be able to record customized audio and video clips that can later be embedded into your e-mail message.

The Video Express Mail player—provided free of charge—works with all e-mail programs including Eudora and Netscape Mail, and may be distributed freely. In addition to sending and receiving multimedia e-mail, Video Express Mail can be used to send and receive real-time video and audio messages on Intranet and high-bandwidth Internet connections. Video Express Mail is available now for $79.95.

ImageMind Software: 800.321.5933; www.imagemind.com

Somewhere Over the Rainbow

Matrox's new **Rainbow Runner Studio**, a companion card for the Mystique graphics card (whose price was lowered 25 percent to $159), provides a state-of-the-art solution for professional quality video editing. The Rainbow Runner Studio will integrate high-resolution Motion-JPEG compression, video conferencing, frame grabbing, TV-output, and hardware MPEG decoding. The card attaches directly to the Matrox Mystique through a daughterboard connector and will retail for $279.

Available separately, is the $89 Rainbow Runner TV, a TV-input ISA card. When used in conjunction with the Rainbow Runner Studio, you'll be able to save television programs and closed captioning information directly to disk, effectively creating a digital VCR.

Matrox: 514.969.6320; www.matrox.com

You Light Up My Life

Wyse has introduced an LCD monitor, the **WY-9307**, that is up to 60 percent brighter than standard CRT monitors. Wyse claims the WY-9307 will be up to 100 percent brighter than a conventional notebook screen, and will eliminate poor edge alignment, fuzzy focus, and screen flicker, even when playing back full-motion video. The WY-9307 will provide a 12.1-inch diagonal SVGA active-matrix display, delivering the same viewable screen area as 14-inch and 15-inch CRT monitors, while occupying a fraction of the space. Other options include a magnetic stripe reader and infrared window for transferring data, touchscreens, and built-in amplified speakers and microphone.

The WY-9307 should be available during the first quarter of 1997 with an expected retail price of $1,695.

Wyse Technology: 800.438.9973; www.wyse.com

Souped Up and Ready to Roll

If you're growing sleepy waiting for your applications to start, then you might be interested in **SuperFassst!**, a new acceleration utility for hard drives. Acceleration Software International claims that SuperFassst!, which retails for $59.95, can boost hard disk performance by up to 496 percent and reduce application launch times by up to 75 percent.

The utility is comprised of three parts: a hard disk accelerator, an application accelerator, and a multitasking accelerator. The hard disk accelerator boosts I/O rates up to five times without compression or caching, while the multitasking accelerator works in the background to automatically boost multiple applications. There's even a Start Menu Acceleration feature that automatically maximizes the speed of any program accessed through the Win95 Start menu.

ACCELERATION

Acceleration Software: 800.754.1128; www.accelerationsw.com

Be a Pal

Grasp Information Corporation has released **SearchPal**, a software tool that allows you to initiate an Internet search from within any Windows application, simply by highlighting text and clicking on the icon.

The convenient and intuitive interface provides single click access to all the major search engines, including AltaVista, Yahoo, Lycos, Excite, and more. In addition, SearchPal can connect you to a number of popular content providers on the Internet such as The Wall Street Journal and The New York Times, or you can customize the search engines and web sites to suit your needs. SearchPal is compatible with Netscape Navigator and Internet Explorer, and is available for $24.95.

Grasp Information Corporation: 617.499.1499; www.grasp.com

PC Fotomat

Panasonic Interactive Media has introduced the **TruPhoto Digital Photo Printer**, the first color printer that is specifically designed to produce professional quality photographs from a personal computer.

Unlike other printers that use ribbons, inks, dyes, and toners, the TruPhoto doesn't produce any waste material. Instead, it utilizes an advanced paper technology called Thermo-Autochrome to produce a standard-sized (3.5 x 5-inch) glossy photographic image at about the same cost as traditional instant photography.

The TruPhoto Digital Photo Printer retails for $499 and includes Photo Suite, a graphics application that can be used to edit and store digital photos, scanned images, or downloaded images.

Panasonic: 888.726.2746; www.panasonic.com/PIM/cool/index.htm

CDR with IDE is Easy as 1-2-3

If you want to start mastering your own CDs but don't have a SCSI interface card, Mitsumi recently released the **CR-2600TE**, a CD-Recordable drive that uses an enhanced IDE interface.

The $599 drive writes at 2x (300K/sec) to ensure stable recording with the lowest possible error rate, and reads at 6x speed (900K/sec) for fast data retrieval. The internal drive features a fast 200ms average access time, and 1MB buffer for optimized performance. The CR-2600TE also includes recording software and three blank 74 minute CD-R media disks.

Mitsumi Electronics: 408.970.0700; www.mitsumi.com

Read Anything Good Lately?

Osborne News has released three new computer books for the technically inclined: **Building VRML Worlds**, **Java: The Complete Reference**, and **Web Site Stats: Tracking Hits and Analyzing Traffic.**

Building VRML Worlds ($39.95) is a comprehensive introduction to Virtual Reality Modeling Language (VRML) and targets designers and web masters who understand the need to create sophisticated WWW sites.

Java: The Complete Reference ($39.95) includes complete coverage of the Java language, including class libraries and development environments.

Web Site Stats ($29.95) examines the most effective ways of tracking web site visitors, including where they came from, the paths followed through a site, and how long they linger on each page.

Building VRML Worlds and Web Site Stats include an integrated CD-ROM containing software tools, information, and evaluation software.

Osborne News: 800.262.4729; www.osborne.com

On the Wall

Presentations to large groups can be difficult if your display is only a few inches tall. Wedge Technology's **ShowBIZ-5000P** notebook may be the solution you've been looking for. In addition to the 133MHz processor and dual-integrated CD-ROM and floppy drives, the ShowBIZ-5000P also features an overhead projection panel and extra cooling fan that can be used with any overhead projector for an impressive presentation six feet high.

The extra cooling fan prevents the projector from overheating the LCD screen, and the special support tray allows the notebook to rest safely on the projector. A remote control, cables, and a carrying case are included in the $3995 price tag.

Wedge Technology Inc.: 408.263.9888; www.wedgetech.com

The Tracker

Check out the **Tracker**, a replacement for your computer mouse. The Tracker utilizes Fujitsu's non-contact magnetic field detection method and advanced motion control algorithm for effortless and accurate cursor control. The Tracker is baseless, compact, lightweight and ergonomically designed for easy left or right-handed control and doesn't feature any moving parts, which can be damaged if it's dropped or mishandled. The Tracker retails for $36.

Fellowes: 800.945.4545; www.fellowes.com

To have your products listed in Radar, send product information to: radar@bootnet.com

Sure, there are cheaper PC and Mac game controllers. But if you're ready to get serious, you need the high-quality, built-to-play-rough peripherals from CH Products.

When you're ready to get serious, you're ready.

Our joysticks, throttles, flight yokes, rudder pedals, and other controllers are born in the USA, and made to take the heat of any battle, race or game you throw their way. So put on your game face, get down to your computer dealer and grab the game controllers made for serious players.

FlightStick Pro (PC & Mac)
FlightStick
Force FX
CH Gamepad (PC & Mac*)
CH Pedals (PC & Mac*)
Pro Pedals
F-16 FighterStick (PC & Mac*)
F-16 CombatStick
F-16 FlightStick
Pro Throttle (PC & Mac*)
CH Throttle
Virtual Pilot Pro (PC & Mac*)
Virtual Pilot
Gamecard 3 Automatic

*Coming soon.

Visit our web site!
http://www.chproducts.com/

CH PRODUCTS
970 Park Center Drive • Vista, CA 92083
Phone 619 598 2518 • Fax 619 598 2524
http://www.chproducts.com/
America OnLine: Keyword: CH Products
CompuServe: Go GAMEDPUB

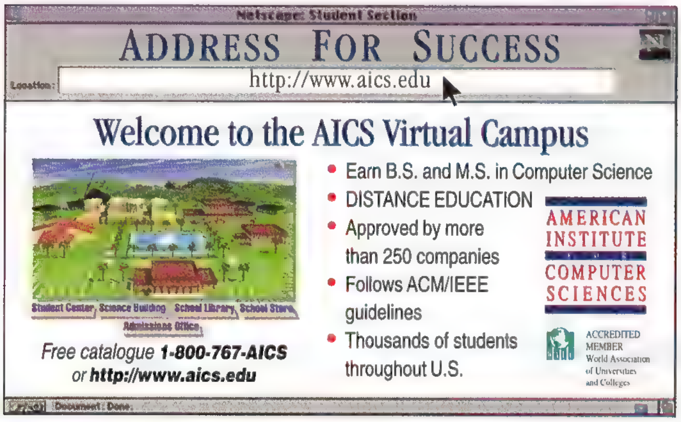
Product Information Number 110

Available at: American ADO Inc. • American TV • Best Buy • Bits & PC's • Circuit City • Computer City • Computer Express • Comp USA • Computerware • Egghead • Electronics Boutique • Elek-Tek • Fry's Electronics • The Good Guys • Incredible Universe • Infotel • Ingram Micro • J & R Computer World • Jetstream • Lechmere • Media Play • Micro Center • Montgomery Wards Electric Avenue • Nobody Beats the Wiz • Office Max • PC Connection, Inc. • PC Tronic • Ricom Electronics Ltd. • Sears • Software & More • Software Plus Ltd. • Susteen • Ultimate Electronics • United CD-ROM • Wal-Mart

ADULT CD-ROMs! OVER 600 TITLES IN STOCK! WILL BEAT ANY PRICE!

FREE SHIPPING, AIRMAIL, WORLDWIDE! VISA, MASTERCARD, AMEX, DISCOVER, CHECK, COD
(800)304-4730 24 HRS/7 DAYS (216)254-2609 INTERNATIONAL (216)254-1206 FAX
GOOSEBUMP GRAPHICS, BOX 5167, MENTOR, OH 44061 (MUST BE OVER 21)

ACTRESSES UNCOVERED	$39	HOME BOYS 1, 2 (GERMAN GAY)	$39
AMATEUR NUDES	$39	INCOGNITO (GERMAN BONDAGE)	$39
ASIAN NUDES	$39	JAPANESE PEARLS 1 OR 2	$39
BARELY 18	$39	MAKE YOUR OWN ORGY (GAME)	$39
BEEF 1, 2, 3 OR PRIME (GAY)	$39	MANPOWER (GAY)	$39
BORIS VALLEJO FANTASY ART	$39	NIX PIX HOT PIX 1,2,3,4 OR 5	$39
CHERRY POPPERS 1 OR 2	$39	NUDE CELEBS	$39
CLIP ART EROTICA	$39	PENTHOUSE 1, 2, 3, 4, 5 OR 6	$59
CUM SHOTS	$39	RARE PICS 2 (WATER SPORTS)	$39
DIE PIETSCHE (GERMAN B&D)	$39	ROPES & CHAINS (BONDAGE)	$39
EROTIC READER (STORIES)	$39	SEALED WITH A KISS 1 OR 2	$39
FOR WOMEN ONLY	$39	SHACKLES, CUFFS & TOUGH STUFF	$39
FORBIDDEN SUBJECTS	$39	STARS & MODELS (GIFs)	$39
GAY WORLD 1, 2 OR 3	$39	SYLT-MADCHEN 1 OR 2 (NUDES)	$39
GIRLFRIEND TRACI, OR TERI	$49	THAI BONDAGE	$39
HACKER CHRONICLES 2	$39	TIFFANY (AMATEUR NUDES)	$39
HARD CORE 2	$39	TRANZ (CHICKS WITH D**KS)	$39
HARD CORE GIFs	$39	VILLAGE COLLECTION (2 CDs)	$49


Netscape: Student Section
Location:
Student Center, Science Building, School Library, School Store, Admissions Office
AMERICAN INSTITUTE COMPUTER SCIENCES
Document: Done

ADDRESS FOR SUCCESS

http://www.aics.edu

Welcome to the AICS Virtual Campus

- Earn B.S. and M.S. in Computer Science
- DISTANCE EDUCATION
- Approved by more than 250 companies
- Follows ACM/IEEE guidelines
- Thousands of students throughout U.S.

ACCREDITED MEMBER World Association of Universities and Colleges

Free catalogue ***1-800-767-AICS***
or ***http://www.aics.edu***

Product Information Number 83

WORLDWIDE TECHNOLOGIES

Now Access The Hottest Adult Sites On The Net Free

Video Teleconferencing
(with appropriate software)

- Swingers Online
- Gay & Lesbian
- Kinky
- Fetish

Massive Archives

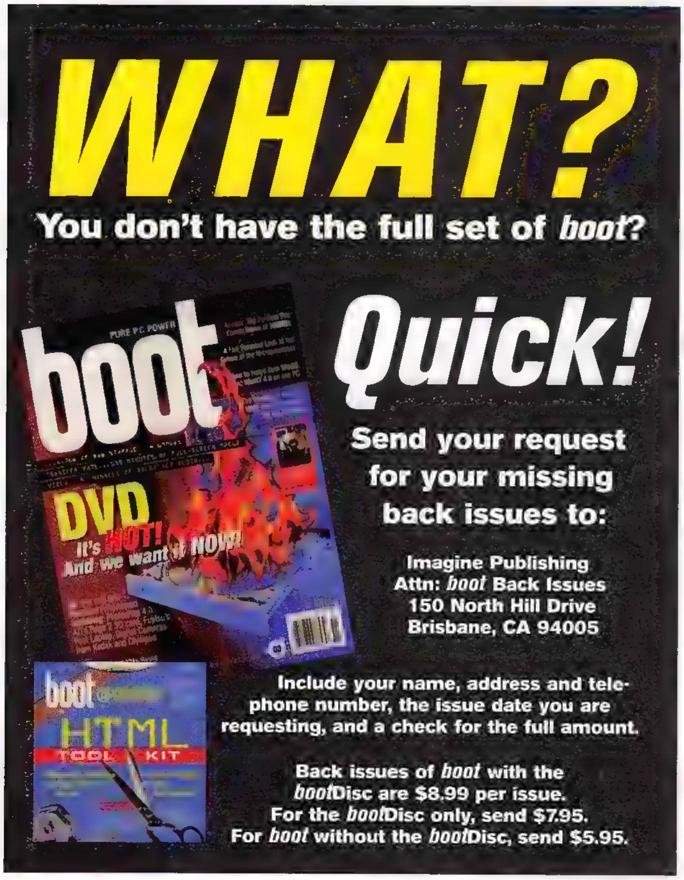
Membership Access:
Voice:
1-800-432-0018
Ext. 6552
Email:
Worldwide97@Juno.com

Best when viewed with
Microsoft Explorer
Netscape Navigator
Will provide if needed

ADULTS ONLY

All trademarks & logos are of their respected holders

Product Information Number 360



WHAT?

You don't have the full set of *boot*?

Quick!

Send your request for your missing back issues to:

Imagine Publishing
Attn: *boot* Back Issues
150 North Hill Drive
Brisbane, CA 94005

Include your name, address and telephone number, the issue date you are requesting, and a check for the full amount.

Back issues of *boot* with the *boot*Disc are $8.99 per issue. For the *boot*Disc only, send $7.95. For *boot* without the *boot*Disc, send $5.95.

CD-ROM ACCESS

12201 Saratoga-Sunnyvale Rd.
Saratoga, CA 95070

TEL: (408) 366-6700
FAX: (408) 366-9066

Over 3,000 PC & MAC titles in stock, ready to ship, at LOW prices. Call for a FREE catalog.

101 Best Games #5 Shareware	$12	Magic Carpet Plus	$19
Apache	$25	Megapak #5	$29
Bioforge	$19	Might & Magic Trilogy	$19
Brain Dead 13	$15	Noctropolis	$15
Buried in Time	$19	Prisoner of Ice	$19
Capitalism	$29	Riddle of Master Lu	$19
Civilization II	$39	Space Ace	$15
Command & Conquer	$39	SU-27 Flanker Win95	$25
Crusader No Remorse	$29	Terminal Velocity	$15
CyberMage	$19	Total Meltdown	$19
Dragon's Lair	$15	Ultima Underworld I & II	$15
Duke Nukem 3D	$35	Under a Killing Moon	$29
Fade to Black	$19	US Navy Fighters	$25
Grand Prix II	$39	Warcraft II	$39
Heroes of Might & Magic	$36	Wing Commander IV	$39
Legend of Kyrandia Trilogy	$29	Toshiba XM-5602B 8X IDE drive	$Call

The World's Largest Selection of Quality CD-ROM Software. 2 Day Air Shipping: $5.95 Per Order within the Continental US. Worldwide shipping at low rates.

1-800-959-5260 http://www.cdaccess.com
8-7 M-F 9-5 Sat PST VISA/MC/DISC/AMEX

Product Information Number 119

compuTalk®

"The World's Source For Geek-Free Computer Radio"

Hosted By Tom King

Radio Ink's Computer Columnist

Saturdays Noon-3 ET, 9-Noon-PT

Saturday Nights 9-Midnight ET, 7-10p PT

CompuTalk Radio Network

1-888-Geek-Free

1-713-610-1200

Sales & Syndication Info:

sales@computalk.com

Visit & Listen on the 'Net:

http://CompuTalk.com

http://www.AudioNet.com

Fax Response: 1-713-610-1202

boot FOR DUMMIES

Perhaps you fear you've bought the wrong magazine, that *boot* is a technical journal for advanced PC hobbyists, and therefore beyond your scope of understanding. Granted, the magazine can be intimidating—insider jargon appears nearly as often as references to simulated helicopter combat—but it is not insurmountable.

The following primer helps assuage your fears, and aids you in navigating the magazine like a PC master.

OPENING THE MAGAZINE

boot comes wrapped in a sheath of space-age plastic, which protects not only the magazine, but a CD-ROM premium. Unless you're equipped with some type of prosthetic hook, we strongly suggest that you use a utility knife to open the packaging **(Figure 1)**; the plastic, as they say, is "strong as a bastard" **(Figure 2)**; and has been known to break fingernails and teeth **(Figure 3)**. If you do not own a CD-ROM drive (and therefore cannot use the CD-ROM), you should not be reading the magazine. May we suggest alternative, more gentle journals such as *After Dinner Mints and Cordials, Modern Birder,* and *Scrimshaw Today.*

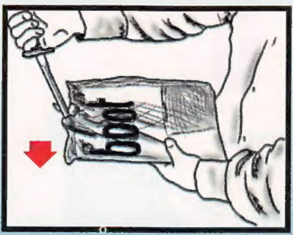


Fig. 1

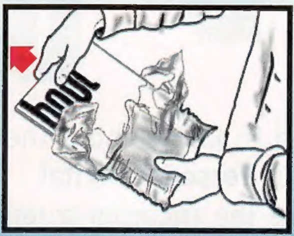


Fig. 2

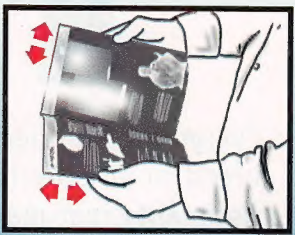


Fig. 3

CONTENTS

Here you'll find two pages describing the material featured in the magazine. Article titles and page numbers appear in one color; article descriptions appear in another color. If during the course of reading *boot* you become disoriented, return to **"Contents"** for reference.

WARNING: *Contents makes liberal allusions to acts of war, and often features imagery of scowling men in aggressive poses. Do not interpret this as a summons to attack your next-door neighbor with a mace, morning star, or oversized flashlight.*

EDITOR'S WORDS

This department features a brief message from Editor in Chief **Brad Dosland**. He, too, is portrayed in an aggressive pose. Don't be frightened—*it's only a picture.*

COMM PORT

If you have feedback concerning PC purchases and upgrades, send it to Comm Port, the magazine's letters section. However, if you simply need basic terms such as "hard disk" and "RAM" verified, send your questions to Santa Claus. He lives at the North Pole, and is legendary for helping children.

PURE LUST

This department is a celebration of "cutting-edge" high-tech gizmos and gadgetry. Laser weaponry appears to be a recurring theme.

VOICE

Three pundits have regular pieces in the magazine's columns section: **T. Liam McDonald**, a former Green Beret, explains how to overthrow transitional governments; **Shel Kimen**, a professional comedian, reminisces about days in the Borscht Belt; and Wyoming Governor **Tom Halfhill** discusses tourism in the Cowboy State.

FEATURES

The magazine devotes 20-odd pages to in-depth stories about the finer points of PC technology. Here you'll find almost as many abbreviations as full-fledged words. A brief glossary:

- **DVD: Del Rizzo brought it back from a trip to Bali. Don't ask.**
- **ISA: Xena's *other* sidekick.**
- **MMX: the size of a typical *boot* editor's waistline.**
- **P166: the most decorated warship in the United States Navy.**
- **1024x768: 786,432!**

12-STEP PROGRAM

What, you think PC upgrades don't take their toll?

BOOTWORTHY

In many ways, the magazine is similar to a jungle cat. All stealth and cunning, it creeps on its haunches, and hides behind fallen logs, stalking new products with heartless impunity. And then it strikes!

P/REVIEWS

Here you'll find previews and reviews of PCs and PC peripherals. Whenever possible, they're set on fire, dropped from airplanes, stabbed with ice picks, crunched in vices, and eaten from the inside out by nanorobotic maggots. It's called "testing," and it's the only way to gauge a product's threshold of pain.

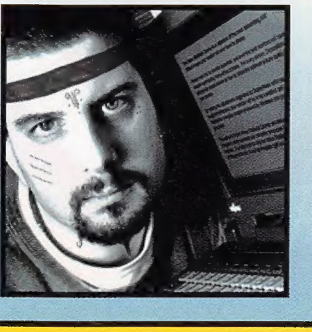
GLITCH

This serious, technically intense column perhaps contains the most advanced material in the magazine. You've been warned.

BOOTWIRE

Here you'll find exclusive reports on the PC industry. And don't think gathering this information isn't risky. Just last month, news editor **Bryan Del Rizzo** voyaged deep into the heart of Silicon Valley with nothing but a tape recorder and a rental car, and returned in a swamp skiff wearing a tribal headdress, and calling himself "Chief Bagogo." In his briefcase was the severed head of a product evangelist, and an expense report for a crate of fighting cocks. And to think, all that work for a 500-word exclusive about portable storage media.

WARNING: Bryan Del Rizzo is *not* an American citizen.



COMING NEXT MONTH

The ABCs of PDAs

Everything you need to know about the new breed of all-powerful **Personal Digital Assistants** that make the tricorder a reality. **PLUS:** A comprehensive collection of PDA software on the *bootDisc*!

bootWorthy: MOTHERBOARDS

boot readers have demanded it and now *boot* delivers! We've looked at all the contenders and narrowed the field down to a handful that we want in our own dream machines.

BOOT MAGAZINE bootworthy

Kodak DC25 Digital CAMERA

DIGITAL CAMERA Shoot-Out

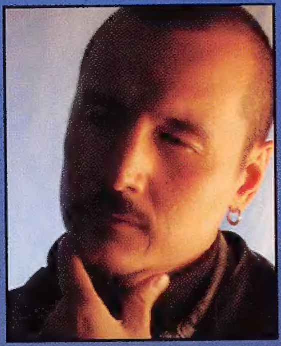
Forget film! These sexy new cameras capture your world in pixels and sport the features you need to paint your scene RGB and never look back. We take all the latest from Kodak, Olympus, Canon, Nikon, Sony, and others out for a test drive.

boot

www.bootnet.com

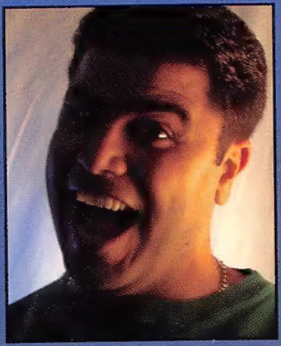
Issue number **08**
on sale **March 4**, 1997.
Order it!

These testimonials are from some people who have played Soultrap...

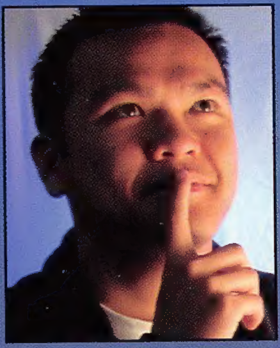


"It's amazingly addictive. Once you start playing you won't be able to stop."

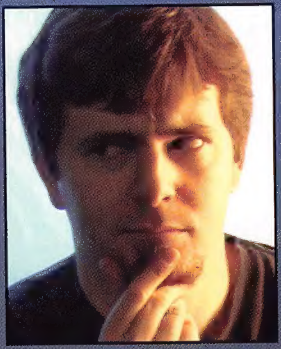
"It's like playing Quake™ and Super Mario® combined in one game, only better!"



"The fact that I could change camera angles as I played was really cool. There's even a smart camera that picks the best view for you!"



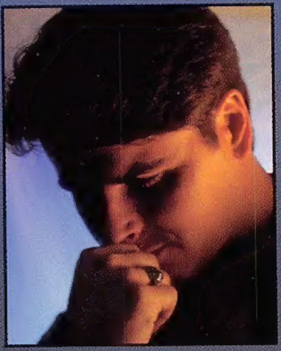
"The soundtrack is incredible, so I love the fact that I can change the music as I play."



"You look up, down... 360 degrees around you. I've never seen anything like it!"

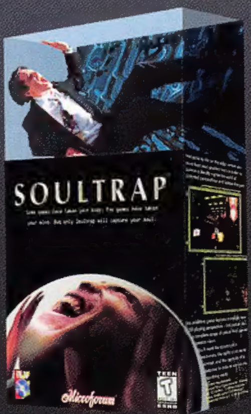
"Stunning 3D graphics, an amazing soundtrack and unmatched playability.. I really didn't think you could get this kind of experience on a PC!"

"It's more exciting to play than Quake™. It challenges you on so many other levels that it goes beyond a traditional shoot'em-up!"



"It's the only 3D game I've played that has a large amount of strategy built into it - its not just another mindless shoot 'em up!"

...But don't believe everything you read. Experience it for yourself.



FREE SOFTWARE OFFER!
CALL 1 800-685-3863 FOR DETAILS!

SOULTRAP™

Microforum®

Available at fine software retailers everywhere.

For more information or to order direct call 1-800-685-3863 or call (416)656-9594 or visit our website at www.microforum.com

"SOULTRAP" ©1996 Microforum Inc. All rights reserved. All other trademarks and registered trademarks are the property of their respective owners.
"SOULTRAP" is a registered trademark and "Microforum" is a registered trademark of Microforum Inc. "Quake" is a trademark of id Software, Inc. "Super Mario" is a registered trademark of Nintendo of America Inc.

Product Information Number 231

A simple touch makes everything easier.

Close your hand around the new Microsoft® IntelliMouse™. Right beneath your index finger is a raised rubber Wheel. In Microsoft Word 97 roll the Wheel forward. You zip up toward the top of your document. Roll it backward and you zip back toward the end. Roll it slowly to move just a few lines at a time. This is how the new IntelliMouse works with new Microsoft Office 97 and lots of other IntelliMouse-compatible programs to make getting your work done easier.

Go to Microsoft Excel 97. Press the CTRL key and push the Wheel forward or backward. You zoom in closer or zoom out farther. See how manageable even a massive spreadsheet becomes.

A final touch.

To scroll through Web pages with Microsoft Internet Explorer, press the Wheel once and move the mouse downward. Your computer goes into AutoScroll mode. Automatically, rolling line by line through your entire document. Without even lifting a finger.

Microsoft

Microsoft®
IntelliMouse™

Where do you want to go today?® www.microsoft.com/hardware/

© 1997 Microsoft Corporation. All rights reserved. Microsoft and *Where do you want to go today?* are registered trademarks and IntelliMouse is a trademark of Microsoft Corporation.